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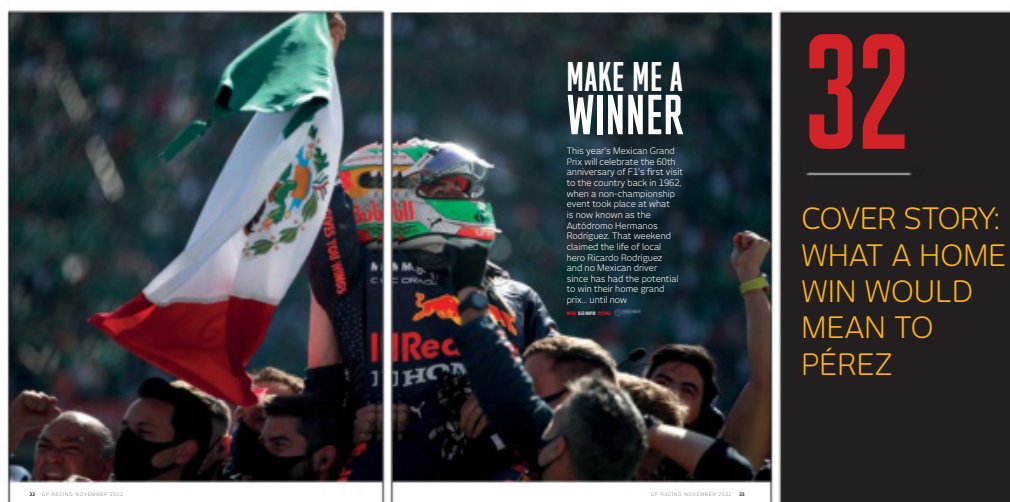


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Hands up for an uncomplicated finale...

Two world championships now for Max Verstappen, both amply deserved for a driver of his outstanding calibre. Is it too much to ask that when the third one rolls around, it won't be overshadowed by some absurd, abstruse and arcane procedural shenanigans?

I refer not to the fact that the stately process under which print media operates dictated that the cover of this month's issue went to press before the Japanese Grand Prix weekend (should you be asking the question which will no doubt be screamed when the cover is paraded on social media: "Why no mention of the championship winner, huh?"). It was likely but not certain that Max would get it over the line at Suzuka.

This uncertainty extended to the three-laps-plus-40-minutes race itself, during which most observers – from experienced media centre hands to the posturing know-it-alls of the commentariat and even the majority of the teams – believed the outcome would be a reduced points payout. Indeed, the points were paid in full only because of a loophole (glaring in hindsight) left when the wording of the sporting regulations was tidied up after the 2021 Belgian GP washout.

Since the race ran to the maximum time limit rather than being stopped, by the letter of the law full points had to be awarded. Ironical given the regulations were rewritten with the intent of limiting the points given in races which don't run the scheduled distance. And it's not as if there was

a shortage of eyes on the new wording.

"I was instrumental with quite a few others in writing that regulation and we know what it's meant to do," said Alpine sporting director Alan Permane. "What they've done is correct to the way the regulations are written, but I'm not sure it's correct to how they're intended."

Another championship, then, has been decided while Formula 1 noisily and publicly discharges a firearm into its metaphorical foot.

This issue of *GP Racing* will have landed on your doormat as the US leg of the calendar at the Circuit of The Americas beckons. While this round and those that follow will be dead rubbers so far as the drivers' championship is concerned, there's still a wealth of narrative threads yet to play out this year.

One of those concerns the form of Sergio 'Checo' Pérez, a podium finisher on home ground last season and a potential winner now he has undisputedly the best car on the grid at his disposal, even if developments have made it less to his liking in recent months. A home win on the 60th anniversary of Mexico's first (non-championship) grand prix would be just the kind of good-news story F1 needs right now.

GP Racing has a podcast!
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Contributors



OLEG KARPOV

A busy month for Oleg as he chats to Sergio Pérez about his hopes for a win at home (p32), plus a trip to circuit designers Tilke (p52)



ANDREW BENSON

Andrew analyses how Ferrari – after such a good start to the season – managed to spectacularly blow its title challenge (p42)



KEVIN TURNER

Autosport's chief editor take a look at BRM's failed Type 15 and the project to revive it that came to fruition at Goodwood (p70)



MAURICE HAMILTON

Maurice continues with his fascinating history of Tyrrell as the team becomes a fully fledged and successful F1 constructor (p60)

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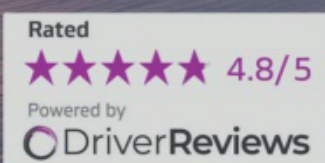


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The first of a winning run

I liked this shot at the time because you could tell by the body language that, over and above the adrenaline rush these two drivers had experienced while racing each other, there was genuine warmth and respect between them. It's taken on an additional poignancy since because this – the Saudi Arabian Grand Prix – was a time when the world title fight was very much on, before Ferrari's challenge fizzled out inconsequentially.

What really made this race for me was the balance of performance between the two cars. Max's Red Bull was showing flashes of the straightline speed that would make it unbeatable later on, but Charles was counterpunching neatly with DRS and the Ferrari's grunt out of corners.



Photographer
Steven Tee

Where Jeddah, Saudi Arabia
When 9.53pm, Sunday
27 March 2022

Details Canon EOS-1D X MkII
24-105mm lens, 1/640th @ F4

There's always a bump in the road

Red Bull's double DNF in the season opener put a nagging doubt in your mind every time you saw the cars on track in the opening segment of the season. A hard-fought win in Saudi Arabia showed Max Verstappen had a quick enough car, but then here in Australia Charles Leclerc always seemed to be out of reach during the race – even before Max retired from second place with a broken fuel line.

I was on the raised gantry overlooking the first corner. Usually you're here to capture the inevitable opening-lap fracas and a few overtakes, but it also gave an overhead view of where Max stopped. You could tell by the way he was walking and the set of his shoulders that he was furious rather than disappointed. I wouldn't have wanted to be in the debrief...



Photographer
Andy Hone

Where Melbourne, Australia
When 4.04pm, Sunday
10 April 2022

Details Canon EOS R3
100-500mm lens, 1/500th @ F6.3









He's coming to get you, Charles

For me this was one of the defining races of the year. By this race – the French Grand Prix, immediately after the half-way point of the season – Ferrari and Charles Leclerc had squandered the advantage they'd built up in those early rounds when Red Bull's reliability was suspect and the car was a handful. Now, whenever Leclerc was in front, you had the feeling something was about to go wrong.

Since it was likely to be the last French Grand Prix for a while, I wanted to get a classic Paul Ricard rear-on shot – like one of those from the 1970s with fat-tyred cars slipstreaming each other into the distance. Charles kept coming round ahead of Max, but for how long?

Leclerc's DNF here turned a deficit of 38 points to 63, a huge swing he'd never recover.



Photographer

Al Staley

Where Paul Ricard, France

When 3.13pm, Sunday
24 July 2022

Details Canon EOS-1D X MkII
400mm lens, 1/800th @ F8



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Getting into the winning habit

It's said that some people make winning look easy. I wouldn't agree with that all the time but it's often the case that a great driver can get into a zone where it seems very few things go wrong for them – even when they do go wrong. In 2022 Max had 'moments' in Spain and Hungary and still prospered.

It's also possible for a driver to feel nothing goes their way. I'd place this race, in Spa, at the intersection of those two trajectories. Max was mighty, majestic, well into a winning streak. Charles Leclerc had a grid penalty and then got someone else's visor tear-off stuck in his brake duct.

Max's joy in this shot isn't just the satisfaction of winning at one of the great circuits, it's the knowledge that he's got the championship well in sight.



Photographer
Steven Tee

Where Spa, Belgium
When 4.28pm, Sunday
28 August 2022

Details Canon EOS-1D X MkII
70-200mm lens, 1/2750th @ F2.8





CHAMPION PARADE

In twilight's last gleaming

Although it's a cliché, and a slightly pompous one at that, to describe photography as “painting with light”, essentially that is what we're doing. And an essential prerequisite of that is, er, light. There wasn't a lot of that being splashed about at any point during Sunday afternoon at Suzuka this year.

There was a lot of uncertainty as the race unfolded about what, if any, points would be awarded. And indeed, Max Verstappen only learned he'd won the championship when he was doing his interviews. The critics disapproved.

For purely selfish reasons I'm broadly in agreement. It would have been a lot nicer to get a celebration shot in the balmy afternoon sunshine of Austin rather than this damp and sparingly lit bit of track!



Photographer
Sam Bloxham

Where Suzuka, Japan
When 5.40pm, Sunday
9 October 2022

Details Canon EOS R3I
15-35mm lens, 1/320th @ 2.8

HOW ALPINE POACHED GASLY TO REPLACE ALONSO

01

An existing contract with Red Bull and an official confirmation for 2023 with AlphaTauri won't stop Pierre Gasly leaving the Faenza-based team at the end of this season after all. He will partner Esteban Ocon at Alpine next year.

Unable to keep Fernando Alonso and defeated in the dispute with McLaren over the services of Oscar Piastri, the bosses of Team Enstone quickly identified Gasly as a key transfer target. However, getting him under contract would only be possible if Pierre were to be released from Red Bull. Fortunately Red Bull's 'driver advisor' Dr Helmut Marko wasn't against the idea – after all, in 2024 Gasly would have been a free agent in any case, and Red Bull might have found it difficult to persuade him to sign a new contract.

The reason for Marko agreeing so readily was that he had already identified American driver Colton Herta as a potential replacement. Herta looked like an attractive option from a marketing point of view, but his results in the IndyCar presented a problem. After finishing third in the championship in 2020 and fifth last year, Colton only managed 10th in 2022 – and didn't score enough points to qualify for a super licence. In theory the FIA could have made an exception for Herta by taking advantage of a slightly vague exemption added to the rules after the coronavirus pandemic began, which allowed for the granting of a super licence if a driver had failed to score the necessary points owing to 'force majeure'.

In Herta's case, though, despite some intense lobbying in the media, there was little in the way of compelling argument to say circumstances outside his control had been responsible for his placing in the championship. As a result the FIA even issued a separate statement on the matter.

"The FIA confirms that an enquiry was made via the appropriate channels that led to the FIA confirming that the driver Colton Herta does not have the required number of points to be granted an FIA Super Licence," it read. "The FIA continuously reviews its regulations and procedures, including with respect to Super Licence eligibility, with the main factors being considered with respect to this topic being safety, experience and performance in the context of the pathway."

Until this point, Red Bull was insistent Gasly would not be released if AlphaTauri couldn't get Herta, but the situation drastically changed after the Italian GP. When Williams driver Alex Albon was ruled out of Monza



PICTURES: MARK SUTTON; AUDI

Even though he was contracted to AlphaTauri and had been confirmed for 2023, Gasly will drive for Alpine next season

by appendicitis, a solution for AlphaTauri emerged out of nowhere. Nyck de Vries, who stood in for Albon, beat the more F1-experienced Nicholas Latifi in his first attempt at qualifying, and picked up two points in the race, finishing ninth.

Marko, known to make impulsive decisions, was not immune to the charms of the performance. A few days after Monza, de Vries met with the doctor in Graz and in the following weeks all parties involved agreed terms. Gasly's departure for Alpine and de Vries' move to AlphaTauri were announced around the same time on the day of Japanese GP qualifying.

De Vries' stunning performance helped Williams, too. After seeing what he showed at the wheel of the FW44 on his grand prix debut, Williams bosses got their final confirmation that it



Sargeant is the preferred choice of the owners for the vacant Williams drive, but the American must get his super licence at the F2 finale in Abu Dhabi



Herta was lined up as Gasly's replacement, but his 10th-place finish in IndyCar meant he fell short of the requirements for a super licence

was time to part ways with Latifi. Coming into the next race in Singapore, Williams announced that the Canadian will not be retained for next year – even though the team has not yet decided on his successor.

There are two main candidates for a Williams seat: current Formula 2 driver Logan Sargeant and Mick Schumacher. The former, an American, is at the moment viewed as the preferred choice of team owner Dorilton Capital, but Sargeant has not guaranteed himself a super licence. Clarity in this matter will only come after the end of the F2 season in Abu Dhabi.

Schumacher, in turn, has not yet renewed his contract with Haas but, according to reports in German media, the negotiations have already started. It is assumed the final

MARKO WASN'T AGAINST THE IDEA – AFTER ALL, IN 2024 GASLY WOULD HAVE BEEN A FREE AGENT IN ANY CASE

Schumacher is believed to be in negotiations with Haas to renew his contract, but could also end up at Williams



De Vries put himself in F1's shop window with his supersub appearance at Monza, and AlphaTauri has snapped him up to replace Gasly



decision concerning Mick will be taken during the US Grand Prix, where team owner Gene Haas will be present. According to insiders, an alternative option for Schumacher at Haas is Nico Hülkenberg. *GP Racing* understands the team needs a German driver to keep a major sponsor – 1&1, a large German telecommunications service provider – happy.

One driver who certainly won't be at Haas or Williams is Daniel Ricciardo. The Australian was left without a seat when McLaren terminated his deal for 2023 – and, following the announcement of Gasly's contract with Alpine, Ricciardo has admitted he will most likely have to accept a reserve driver role for 2023. It is believed he is in the frame at Mercedes, where that role was most recently occupied by de Vries. ▶

FIA CONFIRMS RED BULL BREACHED 2021 COST CAP

02 Red Bull, which won the drivers' championship last year with Max Verstappen, breached the 2021 cost cap rules. The FIA officially confirmed on 10 October 2022 that the team had failed to comply with the allotted spending limit last season. Innuendo to that effect had been circulating during the weeks beforehand.

The initial reports, based on paddock gossip, suggested Red Bull had committed a so-called 'material breach' – that is, spent more than 5% over the limit of \$145million established in the regulations. In addition, it was reported that a 'minor overspend' – by an amount less than 5% over the limit – had been committed by Aston Martin.

This spawned a wave of strong statements from the bosses of many other teams – in particular Toto Wolff, whose team battled with Red Bull for the drivers' and constructors' titles last season. The Mercedes boss said that the breach of regulations by rivals was "an open secret in the paddock" and added that any overspending could not only have affected the outcome of last year's championship, but also subsequent ones.

"The crucial part is that if you've been over in 2021, then you've been over in '22," he said. "That means you have an advantage in '23. If it's true that they've [Red Bull] homologated the lightweight chassis this year, they may use it next year. So it's really a cascade of events that can be influential in all of the three championships."

Such comments sparked an angry reaction from Red Bull team principal Christian Horner. "Unless there is a clear withdrawal of those statements, we will be taking it incredibly seriously and looking at what the options



Horner (left) was unhappy with the comments Wolff (right) made regarding Red Bull's spending, but the FIA has since confirmed Horner's team did indeed breach the cost cap

available to us are," he said, adding that he was "100%" sure Red Bull had stayed below the \$145 million limit.

The FIA's statement may have been a disappointment to some of the more strident voices in the paddock, since it confirmed Red Bull had committed a minor overspend rather than a material breach, and Aston Martin and Williams were guilty of 'procedural breaches' only. In Williams' case, the breach was already a matter of record and caused by delayed receipt of paperwork.

As this issue of *GP Racing* closed, the FIA had not revealed any details about the Red Bull case – neither about the discrepancies between the team's calculations and its own, nor the amount by which Red Bull, in its opinion, exceeded the limit. The matter of possible sanctions also remained open: the regulations provide several options such as a public reprimand, a deduction of constructors' or drivers' championship points, exclusion from events, limitations on aero testing, or a fine. It is likely the matter may go before an adjudication panel, since Red Bull insists it was in compliance with the rules.

"Our 2021 submission was below the cost cap limit, so we need to carefully review the FIA's findings as our belief remains that the relevant costs are under the 2021 cost cap amount," said Red Bull. "Despite the conjecture and positioning of others, there is of course a process under the regulations with the FIA which we will respectfully follow while we consider all the options available to us." ►

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- > Nyck de Vries: the supersub who's bagged a race seat
- > The Aerodynamic Oscillation Metric explained
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24 RACES, SIX SPRINTS FOR 2023

03 **Formula 1 has released the** calendar for 2023 – and is now one race short of the goal of 25 rounds a year Liberty Media set after buying F1’s commercial rights.

This year, owing to events in Ukraine, F1 will not even reach the 23-race mark. But next season two tracks will return to the calendar and one new one will be added, all contained in a mildly rejigged order which is claimed to chime with F1’s new sustainability ethos.

China is scheduled to take place in mid-April, the traditional date for the Shanghai race, for the first time since the start of the coronavirus pandemic. In addition, as previously known, Qatar will also return to the calendar. The race on the Losail circuit wasn’t held this year, since the country was busy preparing for the FIFA World Cup. Qatar has a 10-year hosting contract and it remains possible the race will transfer to a different venue.

In November F1 will hold a race in Las Vegas, at the new street circuit currently being overseen by Hermann Tilke’s company (see p52).

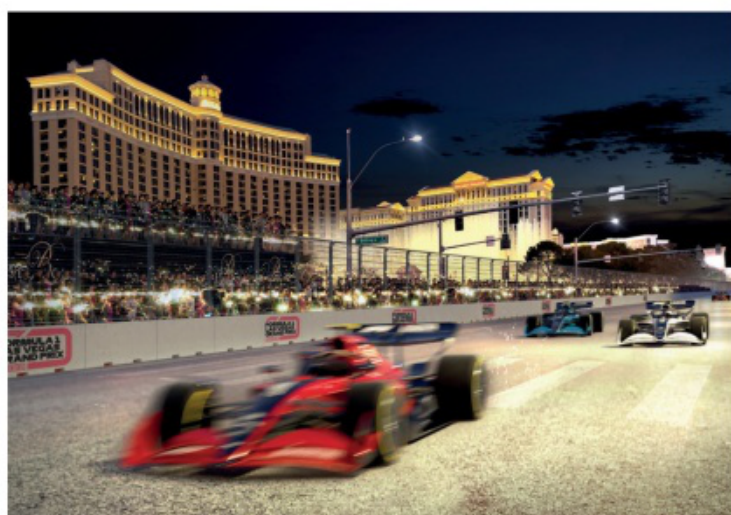
With the exception of the French GP, which hasn’t had its contract renewed, all the other rounds have retained their places. Separately F1 announced a new contract for Monaco, the previous agreement having expired this year.

F1 has largely failed to deliver on its own promise to make the schedule more regional to avoid unnecessary travel. There’ll be two-week gaps before and after the Australian GP, despite calls from the teams to pair it with a race in Asia. The event in Canada, too, has kept its mid-June date and will take place between the rounds in Spain and Austria.

Azerbaijan is a week before Miami. One of the most notable changes is the new date for the Belgian GP. It will now take the French GP’s slot in July.

There are two triple-headers in the new calendar. The first is formed by races in Imola, Monaco and Barcelona; the second will include rounds in Austin, Mexico City and São Paulo. The championship will start in Bahrain, where the race is scheduled for 5 March, and will end in Abu Dhabi on 26 November.

Additionally, the FIA has finally confirmed there will be six sprint events next year. It has not yet announced at which tracks the short Saturday races will be held.



Las Vegas joins the world championship roster next season as race 23 of a record-breaking 24 GPs

WITH THE EXCEPTION OF THE FRENCH GP, WHICH HASN’T HAD ITS CONTRACT RENEWED, ALL OTHER ROUNDS HAVE RETAINED THEIR PLACES

F1 MASTERMIND

Your chosen specialised subject: the world’s greatest motorsport

- Q1** When Formula 1 returned to Mexico in 2015 who were the four British drivers on the grid?
- Q2** Fernando Alonso has won two GPs on three separate occasions. Which two are they?
- Q3** Who was Daniel Ricciardo’s team-mate in his first Formula 1 race, at Silverstone in 2011?
- Q4** Derek Warwick, Martin Donnelly and Damon Hill were the last three British drivers to race for Arrows in F1, but who was the first to do so?
- Q5** Which constructor claimed more F1 world championship wins with its cars: Cooper or BRM?
- Q6** Who am I? I started 108 GPs from 1979 to 1986 for Shadow, Lotus, and Brabham, winning twice and claiming five poles.
- Q7** True or false: Michael Schumacher was the first German to win the German GP?
- Q8** Argentina held 20 world championship GPs, but when was the last of these: 1982, 1989 or 1998?
- Q9** Sebastian Vettel was the fourth driver to win 50 world championship F1 races, but at what GP did he achieve the feat?
- Q10** Which was the last GP, up to and including Singapore, that Max Verstappen led but didn’t win?



1 Jensen Button, Lewis Hamilton, Jolyon Palmer, Will Stevens
2 Bahrain and Germany **3** Vitantonio Liuzzi **4** Brian Henton
5 BRM (17 to Cooper's 16) **6** Elio de Angelis **7** True **8** 1998
9 Canada 2018 **10** Austria 2022

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crash, but Stewart took the lead from Hill and the outcome was uncertain until Graham got back in front, and Jackie started to slow down with engine problems that dropped him to 7th. So Graham won his second title by controlling that Mexican race, having missed out so marginally four years earlier.

In between those events came another historical note. Victory in Mexico for Honda in 1965 was the manufacturer's first grand prix win, and the only one with both an engine and a chassis built in Japan. In the last race of the 1500cc non-turbo F1 period, the Honda's miniature V12 engine responded perfectly to the altitude and low barometric pressure of the high central plateau, allowing American Richie Ginther to take his sole grand prix victory.

Honda-powered cars have won more often in Mexico than any other engine manufacturer: Max Verstappen's victory last year took this tally to five. While the power unit is running under the Red Bull name this year, there is effectively a chance of taking a sixth win and perhaps we could see an opportunity for a Mexican to shine as a result.

Pedro Rodríguez won two grands prix in his career, but never made it to the podium at his home race.

For Sergio Pérez, the reintroduction of the race in 2015 has yielded some good times. He outqualified his Force India team-mate Nico Hülkenberg at the comeback event and, despite being unlucky with the timing of a Safety Car, Pérez scored useful points. He has failed to score on just one occasion, due to a brake failure in 2018, and it hurt. "I feel sorry for the team and for the fans who have been incredible this week" Sergio said afterwards, "They always make me feel very proud and they give me amazing support."

That was seen very clearly last year when, armed with a Red Bull, he became the first Mexican to earn a podium at the Autódromo Hermanos Rodríguez. The atmosphere in the stadium section of the track was electric both before and after the race as his ardent supporters stood and waved and drowned out any other noise in the background. As Pérez said last year, "Winning in Mexico would be my biggest dream, to be honest, it will be something that will fulfil me a lot in my career."

Earlier this season Sergio won in his adopted home of Monaco; thanks to the competitiveness of the car, the goal of victory in a personal part of the world is definitely within reach. Having seen six different polesitters over the past six outings at the circuit, perhaps he can earn the seventh and convert it into a historic victory to create many anniversary celebrations in the future.

MEXICAN WAVE: TIME FOR A HOME WIN

Anniversaries create cause for celebration and have become a useful way for event organisers to ramp up interest. A few weeks ago I was commentating at the Goodwood Revival, a motorsport event based on racing that took place from 1948 to 1966. The organisers generated a huge buzz by marking the 75th year of the Ferrari brand, as well as the recognition of Graham Hill's first world championship title (1962), which drew in a remarkable collection of assorted racing cars that he had driven.

The Mexican Grand Prix is also about to make a big noise about its 60th anniversary, despite being an irregular feature on the calendar during that time. The first Formula 1 race held at the Magdalena Mixhuca Park in Mexico City took place in November 1962 and, while it was a non-championship GP on that occasion, the event was very significant.

Local hero Ricardo Rodríguez had stunned fans and Ferrari alike when he made his F1 debut with the team at the Italian Grand Prix the year

before; he had qualified on the front row and remained the youngest driver to do so until Max Verstappen pipped him with a front-row start in 2016. Tragically Ricardo, the younger of the two Rodríguez brothers, was killed in practice for that first race in Mexico, a devastating loss to a nation that was just beginning to engage with F1 and which had to wait over four years until brother Pedro Rodríguez took a win in South Africa.

In the meantime, Graham Hill's attempt at wrapping up a second title had come to blows in Mexico. The 1964 race was one of the most fascinating F1 season finales in history, with three British drivers competing in three different teams and all on target to be champion. Hill ran third in the early stages and that would have been enough, even with great rival Jim Clark leading the way in his Lotus. But John Surtees was also in the mix and his Ferrari team-mate Lorenzo Bandini was playing the game. Bandini battled furiously with Hill, ran into the back of the BRM, and caused sufficient damage to put Graham out of the hunt – especially when Clark's engine gave up on the final lap and Bandini gave a nod to the Ferrari outfit to allow Surtees past and win the title by a point.

Because 16 of the 21 world championship grands prix held in Mexico have run towards the end of the season, they have often been crucial in title battles. In 1968 Graham Hill was in a similar situation, fighting Jackie Stewart and Denny Hulme for the crown. Hulme was out early when suspension failure caused him to



The Rodríguez brothers. Ricardo (left) was killed in practice for the 1962 race



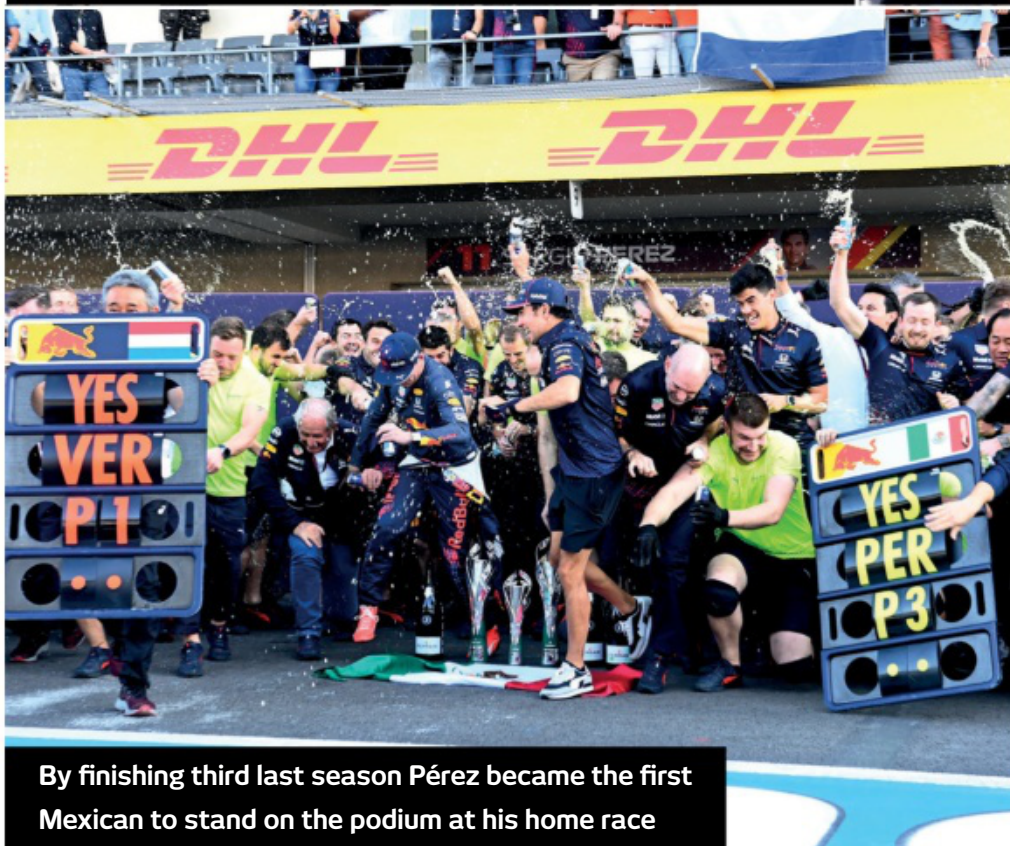
Surtees and team-mate Bandini in 1964, after they swapped places to give Surtees the title



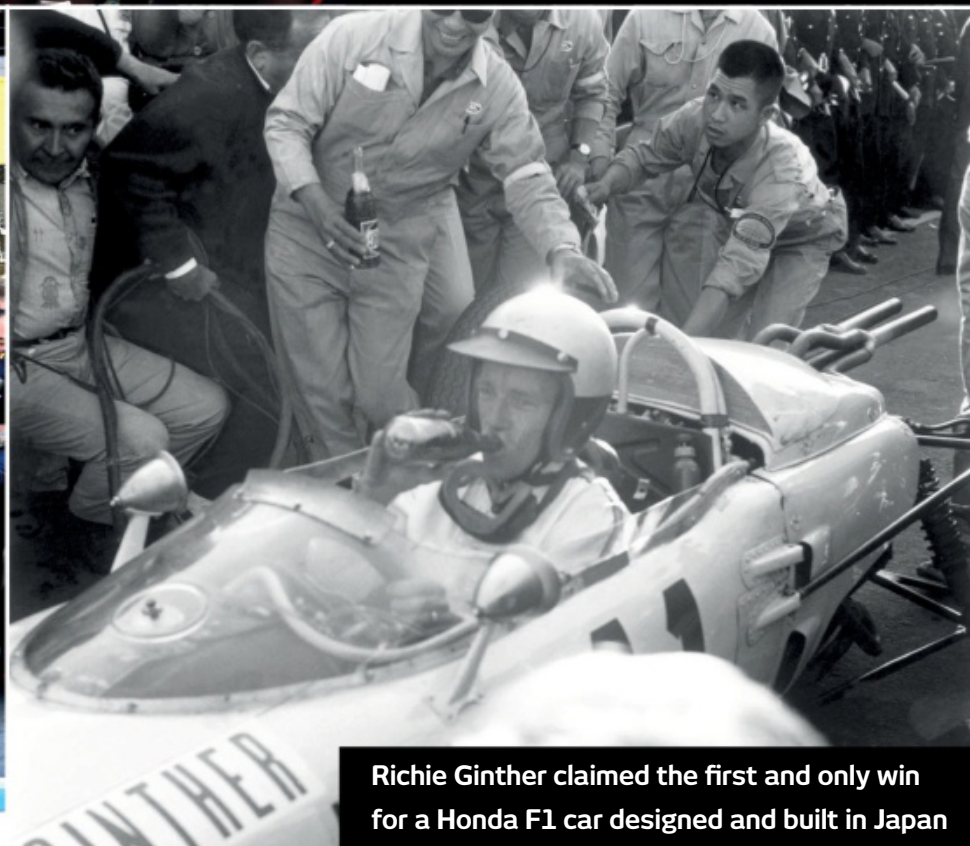
In 1968 Hill made up for his disappointment at the same track four years earlier to claim his second world championship



For Pérez winning in front of his adoring fans in Mexico remains his ultimate dream



By finishing third last season Pérez became the first Mexican to stand on the podium at his home race



Richie Ginther claimed the first and only win for a Honda F1 car designed and built in Japan



UNDER THE HOOD

PAT SYMONDS

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designed to support the load of the full trailer. An F1 car will have to deal with some variation of mass between a full and empty fuel tank but this is only around 15% of the weight. This is roughly equivalent to the difference in a small road car between having just the driver in the car or adding three passengers. Much more significant is the huge aerodynamic forces the car can generate, and which have to be fed through the suspension to the road. If the F1 car springs were soft enough to give a smooth ride then these enormous loads would grind the car into the ground at high speed.

A further complication is that with a Formula 1 car we need to provide a stable aerodynamic platform. What this means is that the

car will produce its best downforce when it is at a certain height from the ground, known as the ride height. Ideally we would like the car at this height no matter what loads are imposed on it, and this was one of the objectives of active suspension. However to achieve this with a passive arrangement we need to have stiff suspension which, just like the bouncing trailer, will reduce our tyre grip – particularly in slow corners when we don't have so much aerodynamic load.

So how do we achieve a reasonable compromise? The answer lies in simulation and testing on sophisticated ride rigs. It's not difficult to simulate on a computer the ride qualities of the car. A mathematical model is programmed and virtual vertical inputs are made at the tyre. The model will then compute the variation in vertical tyre force and chassis deflection. These inputs can be done for different frequencies and the outputs examined. The response of both the wheel and the chassis are then plotted against frequency in what is known as a Bode plot.

Now every system like this will have natural frequencies. For each part that can move independently of another, a natural frequency will exist. So in our complete car we have frequencies associated with pure bounce, with pitch and with roll as well as a frequency of the wheel itself bouncing, which is known as wheel hop. There are many other natural frequencies but they aren't quite so relevant to ride.

The two most important frequencies on an F1 car are the bounce and pitch ►

WHY RIDE QUALITY ISN'T A COMFORT ISSUE

The term 'ride quality' is more generally associated with luxury saloon cars than with Formula 1 machinery but, in its own way, it's equally important to any form of competition car. To understand why we first have to ask what we mean by ride quality.

Any vehicle travelling over bumps in a road will experience a vertical force as it traverses those bumps. Some of that force will deflect the tyre sidewall and some will be passed through the wheel to the suspension, where again some deflection will take place. Finally some force will act on the chassis and the driver.

The way the force is transmitted and absorbed by the tyres and the suspension depends on their stiffness, and the final effect on the chassis and driver depends on both these stiffnesses and the mass of the vehicle. If you drive behind a car towing a light two-wheel trailer that has no load, you will see it skipping and jumping over bumps in the road. When it has a load in it the vertical motion is much more controlled.



Ride quality in F1 is crucial to give the car a stable aerodynamic platform to produce its best downforce

But why do we need good ride? It's often perceived that a stiffly sprung car with heavy damping is very responsive and therefore more suited to sporty driving. In some respects this is true but it comes at a cost. If we consider that trailer again, if the bouncing is severe enough then the wheels may actually leave the ground. When they're in the air they obviously aren't gripping the road and, if this occurs in a corner, momentarily the trailer cannot negotiate the corner.

In fact it's the variable load the trailer has to deal with which explains part of the reason that getting a good ride quality is difficult in a racing car. The spring stiffness of the trailer has to be

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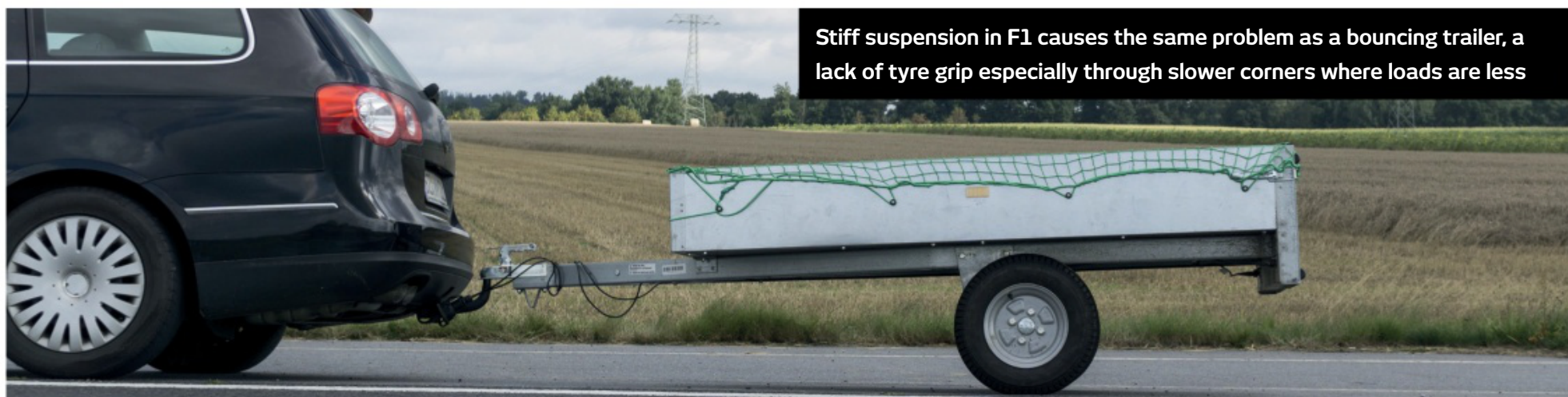


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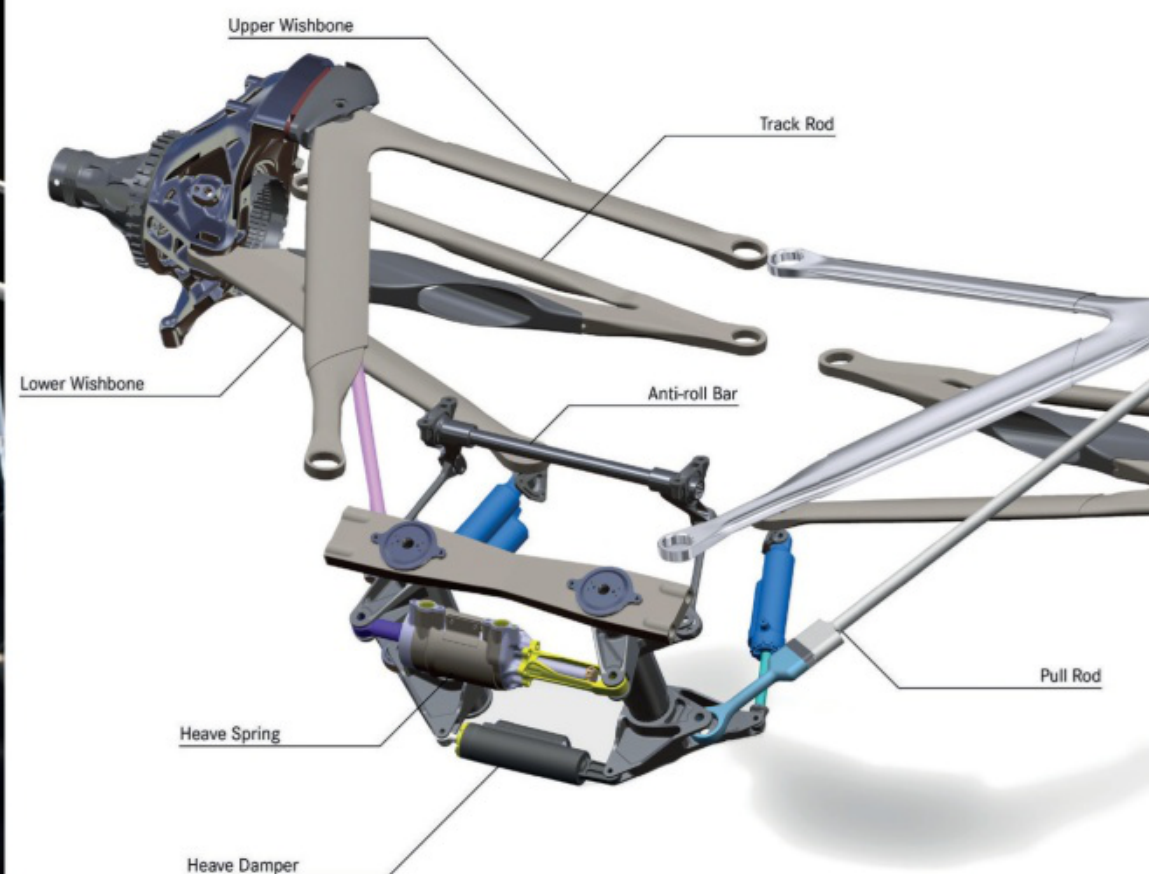


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Stiff suspension in F1 causes the same problem as a bouncing trailer, a lack of tyre grip especially through slower corners where loads are less



Formula 1 suspensions are, like most engineering decisions, a balancing act with the ultimate aim of allowing the car to go quicker

frequencies. These will determine the control of the vertical tyre forces and the stability of the body in the sense of providing a stable aerodynamic platform.

Unfortunately, with a passive suspension system and particularly with one that has to carry a variable load, it's difficult to tame these frequencies. So, as with all engineering design, compromises have to be made. The testing will yield what are known as transfer functions. These are measures of the variation in wheel load or body position. Most teams will have developed a ride quality index to balance these transfer functions to give the best trade-off of the conflicting requirements, allowing them to tune their spring and damper settings for best performance.

This ride quality index isn't a magic number, however. Different aerodynamic characteristics and indeed track roughness will affect behaviour. If the aerodynamics of the car are such that it's not particularly

sensitive to ride heights then it could be sprung relatively softly. If the aerodynamics dictate the car needs to be held close to the ground, then it will need stiff springs.

While all F1 cars since the advent of underbody aerodynamics have tended towards the latter, the current regulations, which very much rely on ground effect, have dictated extremely stiff suspension setups. Consequently the ride is

IF THE AERODYNAMICS OF THE CAR ARE SUCH THAT IT'S NOT PARTICULARLY SENSITIVE TO RIDE HEIGHTS THEN IT COULD BE SPRUNG RELATIVELY SOFTLY

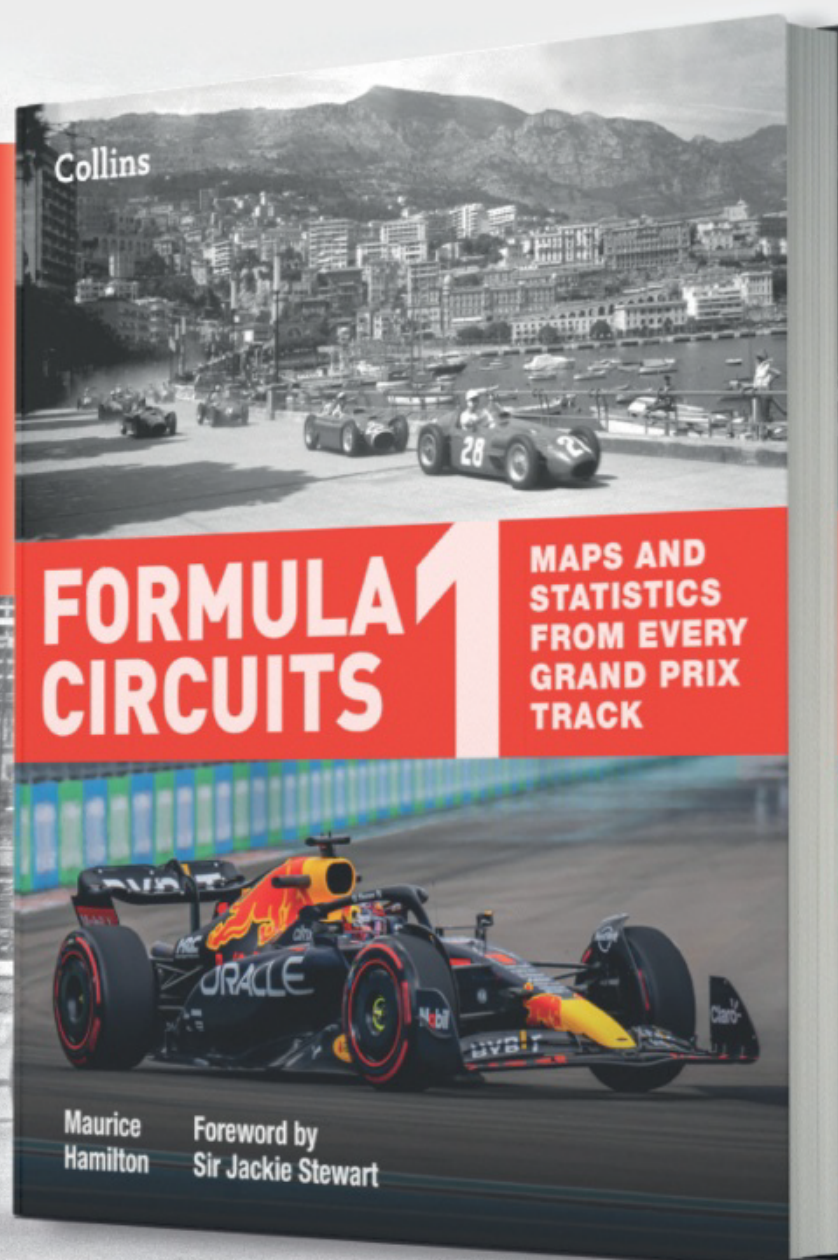
harsh and the variation in vertical load at the tyre contact patch is more extreme than the vehicle dynamics engineers, and drivers, would like. This manifests itself in poor grip in low-speed, bumpy corners and a harsh environment for the driver. Like many other engineering decisions it comes down to compromise and redefining that ride quality index to minimise the most important parameter in motor sport – laptime.

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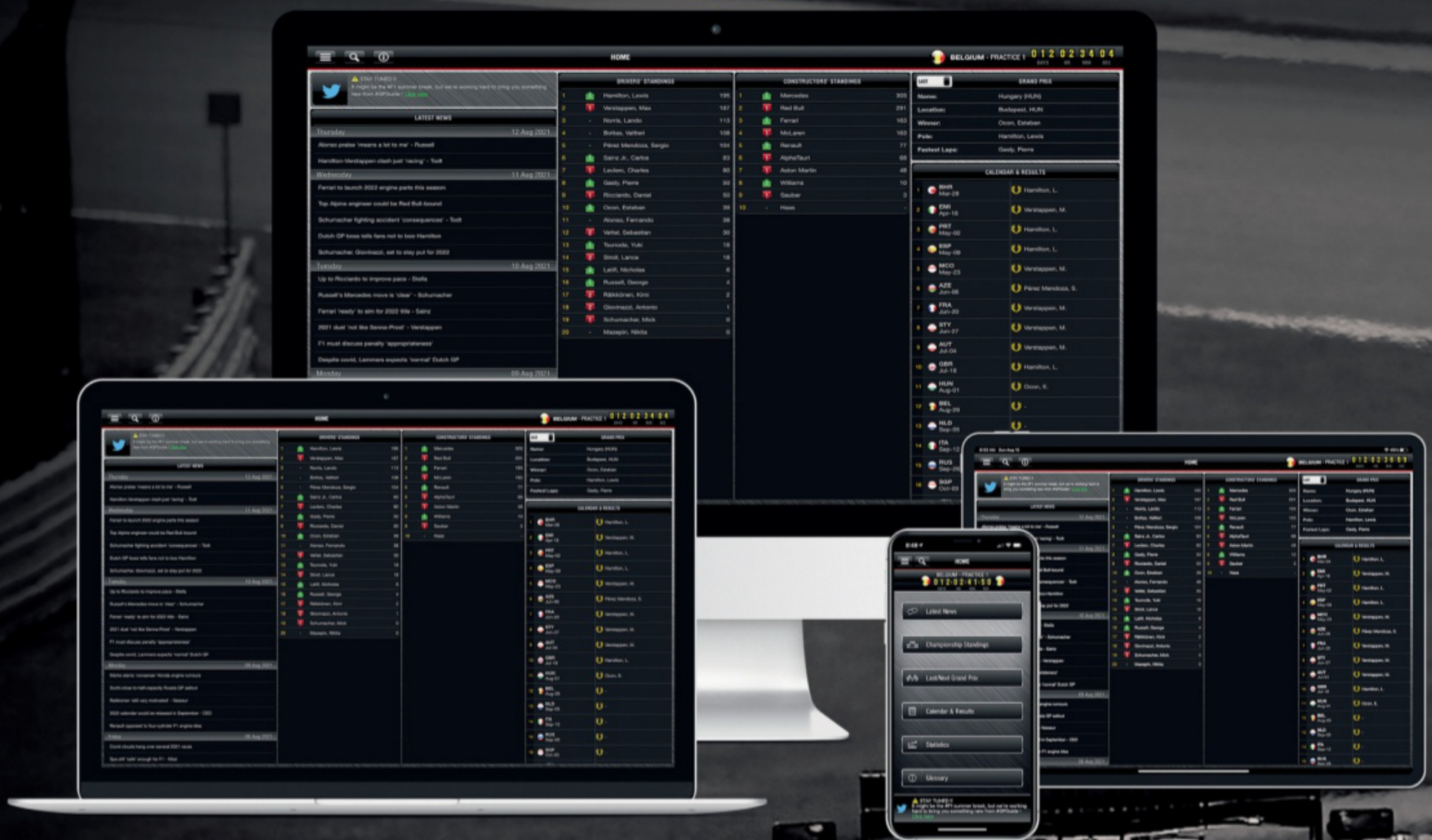
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STRAIGHT TALK

MARK GALLAGHER

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PIASTRI MOVE CAUGHT ALPINE BY SURPRISE

Alpine's driver woes have not made for great reading particularly if, like me, you have a soft spot for the French brand which Renault boss Luca de Meo has positioned at the forefront of the Group's sporting ambitions.

Only those most intimately involved in the Oscar Piastri saga know the precise detail, though we heard enough via the Contract Recognition Board decision to know that Alpine had failed to get its man because of the small matter of not having a binding contract in place.

While Alpine's CEO Laurent Rossi has cried foul, accusing the Piastri camp of disloyalty, the contract debacle has acted as a brutal reminder of F1's business environment. To adapt a well-worn phrase, if you no longer go for a gap which exists in the contract you are no longer a racing driver's manager. It's even easier if there isn't a binding contract in the first place.

Mark and Ann Webber, owners of Piastri's management company Jam Sports Management, have been around the block, understand the game

lies last in the world championship with a car featuring an average qualifying deficit of 2.169s* across the first 16 races), Webber knew the opportunity to slide Piastri into McLaren in 2023 was golden. Jam today, so to speak.

Much has been made of the fact that Alpine has held on to fourth in the world championship at McLaren's expense. That performance was made possible by both drivers delivering points (66 by Esteban Ocon and 59 by Fernando Alonso, as of the Italian GP). McLaren has had one driver do the majority of its scoring (post-Monza the tally was Lando Norris 88, Daniel Ricciardo 19). Simply put, McLaren really needs a second Norris and believes Piastri ticks the box.

All this has left Alpine looking inept despite the presence of team principal Otmar Szafnauer and the team's chief legal counsel Benedicte Mercer. Both are highly experienced. They know the importance of binding contracts, which made the revelations of the CRB all the more surprising.

Letters of intent and heads of agreement simply mean you're engaged, not married. You might be disappointed when the other party walks away, but it's not a divorce – just a break-up. It's not you, it's me.

Behind the delays, and inability to get the contract done, the unravelling of Piastri's future plans at Alpine caught the leadership on the hop.

That both Daniel Ricciardo and Alonso have stayed only for two seasons, and Piastri's management have bailed, has to be a concern. Throw in the management changes, from Cyril Abiteboul's departure last season, Marcin Budkowski's in January and the rejigging of David

Brivio's position, and that concern deepens.

Rossi knows the marketing power of F1 and regards the arrival of Szafnauer as a key appointment, one which leaves him to concentrate on the formidable task of launching Alpine's new models and growing the business globally.

To make the breakthrough it needs, Alpine has a mountain to climb. A level of stability, focus and ambition which unlocks the potential within Team Enstone, and a pair of drivers able to race with the best. Preferably with long-term contracts.



Laurent Rossi accused the Piastri camp of disloyalty but Alpine, by not having a binding contract in place, hasn't come out of the saga with much credit either

and how fickle it can be. Mark Webber knows both Fernando Alonso and Flavio Briatore rather well, so there was no surprise at the speed with which the network set to its business, a calculated game of contractual musical chairs triggered by Sebastian Vettel's decision to retire several years after he started thinking about it.

Faced with the prospect of his man being parked at Williams (a team which, at the time of writing,

THIS MONTH

Matteo Franceschetti

Co-founder and CEO, Eight Sleep

Mercedes F1 partner Eight Sleep describes itself as “the world’s first sleep fitness company”. Its products use thermoregulation and smart technology to ensure high-quality sleep and, through that, effective recovery – increasingly valuable to human performance as the F1 calendar becomes more densely packed and demanding...

CV

2014

Co-founder and CEO,
Eight Sleep

2012-2014

Co-founder and
co-CEO, Global
Investment
Renewable

2012-2013

European Business
Advisor, Relight

2008-2012

Co-founder and
co-CEO, Global
Investment

2008-2009

Associate,
Allen & Overy

2005-2008

Associate, Freshfields
Bruckhaus Deringer

2001-2005

Law, University
of Ferrara

GP Racing: Your professional background is in law but you’ve also got a background in sport...

Matteo Franceschetti: My DNA is as an athlete, a tennis player, I did a bunch of ski races when I was a kid but I was mainly a tennis player. As a teenager I was playing tennis every day. I always loved cars through my dad – he was doing hillclimbing and was the Italian champion twice. I was able to convince my parents to buy me a kart and I raced that between the ages of 16 and 18. I stopped for a little bit, but then I started racing cars. I then did two seasons in hillclimbing, the European Championship, and I raced in the 12 hours of Abu Dhabi in a Maserati GT. We finished third in the GT4 category.

GPR: Why did you go into the sleep business?

MF: As an athlete I’ve always been focused on optimisation and recovery. We have technology in two thirds of our lives but every day we spend eight hours or so lying on a piece of dumb foam and pretend to wake up fully refreshed. Why, if Elon Musk is taking me to Mars, do I still spend a third of my life on a piece of dumb foam? That didn’t make any sense to me so I started looking at all the clinical papers and research, to understand a way to leverage technology to enhance and optimise our sleep.

GPR: How do you go about doing that?

MF: There is plenty of medical evidence that being at the right temperature can improve your sleep performance but that optimum temperature changes during the night. And it’s very personal – it can vary by age, gender, the percentage of body fat, whether you’ve had alcohol, and many other factors.

The device leverages machine learning to optimise every minute of the night. It’s like sleeping on a stethoscope: there are sensors embedded that are able to track your

INTERVIEW STUART COOLING

heart rate, your respiration and your sleep quality. We are reaching medical-grade accuracy with this. And the device also features what we call active cooling – a thermal engine that circulates liquid which can create any temperature between 55°F and 110°F. There are now two products. One is the whole mattress, one is a cover that can be installed onto any mattress.

GPR: How long did the research and development take?

MF: I slept on the prototype! In the early days there were a lot of cables and quite a few bugs. Over time we were able to attract more engineers. We launched a crowdfunding campaign in 2015 with the first product and we sold close to 8000 units in pre-orders. And we kept building the product to the point where the Mercedes team can sleep on it.

GPR: Apart from having a personal interest in racing cars, what attracted you to Formula 1 as a marketing platform?

MF: It’s the combination of technology and the global presence. And obviously right now F1 is becoming more and more relevant in the US. I never like to do what everyone else does. A lot of brands in the US, they just go for NFL, NBA, the obvious choices. In the US F1 is just starting, so I’m betting on the future instead of the past.

GPR: What’s next in terms of product evolution?

MF: This is just the beginning. We’ve built prototypes for a bed which can control light, noise, air quality and even oxygen. When we control all the environmental factors, there will be an evolution in terms of health. The idea is that in five years from now, going to bed will be more valuable than going to your doctor. Imagine if you could detect early signs of illnesses such as kidney stones or even certain types of tumour – that’s what we’re building.





MAKE ME A WINNER

This year's Mexican Grand Prix will celebrate the 60th anniversary of F1's first visit to the country back in 1962, when a non-championship event took place at what is now known as the Autódromo Hermanos Rodríguez. That weekend claimed the life of local hero Ricardo Rodríguez and no Mexican driver since has had the potential to win their home grand prix... until now

WORDS OLEG KARPOV PICTURES 





SERGIO PÉREZ picks up a pen and begins circling cities on a map of Mexico *GP Racing* has brought to the interview. “We went here, we went here,” he mutters, quickly filling the country with circles.

When Sergio was little he travelled all across Mexico from one kart track to another, together with his father and older brother – also a racing driver, who found success in the Mexican NASCAR series.

“From here to here,” Checo first points to his native Guadalajara and then Monterrey, “that was a 24-hour drive.”

GP Racing delicately observes that the two points on the map aren’t that far apart.

“We just drove in a motorhome and it stopped halfway through, because we had a water leak, so it just took us a bit longer,” laughs Checo. “I was around 12 years old, and I didn’t even race that weekend. I just went to watch my brother.”

Checo hails from a genuine racing family. His father Antonio Pérez Garibay was a driver manager back in Mexico, so both his sons grew up surrounded by racing drivers.

“We knew everyone on track, off track, so we had good friends around,” says Checo. “It was great fun, you know, we just enjoyed [travelling together], stopping on the motorways to eat some tacos. It was a very enjoyable time.

Yeah, we were all very happy just going racing.

“It’s very different, racing in Europe versus racing in Mexico. It’s much more relaxed, and everyone is much more friendly. There are a lot of friendships. I guess, also, when you come to Europe, and the series are more professional, things get more serious.”

Checo wasn’t a typical Mexican driver. By the time his father dropped him off at Toluca Airport – after a six-hour drive – with a one-way ticket to Germany, Mexico had already begun to forget about Formula 1. It had hosted its last grand prix when Checo was two years old, and nearly a quarter of a century had elapsed since a Mexican last started a world championship F1 race (Héctor Rebaque in the 1981 Caesars Palace Grand Prix, to be precise).

“We only had drivers in IndyCar, which was the most common path there,” says Pérez. But he, for some reason, always had his eyes only on F1 – despite the fact that a move to the USA was considered almost the only route for Mexican racers to make it to the top. Many tried to convince Checo that Formula 1 wasn’t for him.

“Yeah, many people, of course, [were sceptical],” he says, “because for a Mexican to come into Europe, to open all the doors over here, it wasn’t going to be easy. But we tried, we gave our best.

“I always wanted to make my career in Europe. Because



Carlos Slim Snr (left) and Jo Ramírez (right) were both important people to Pérez on his journey from Guadalajara to F1



Jimmy Morales (left) was another big supporter of Pérez, who is seen here also with brother Antonio (far left) and Carlos Slim Jnr (right)

didn't have much idea of how racing was in Europe, he gave his best with what we knew at the time."

All Morales could help young Checo with was allocating money towards his European adventure from the Escudería Telmex programme's budget. Jimmy himself had won all the most prestigious local series, but never raced overseas.

"It was the only option basically to come on my own," Pérez recalls. "There was no money around to put someone else on the plane with me and, yeah, be with me [in Europe]. That would have been ideal, as I was quite young. But that wasn't a possibility at the time.

"It was all new for us, as a country. I didn't have anyone, it was just me and my family. And F1 was something super, super new. Not just for me, but for my whole country. So it was pretty hard to get any advice from anyone.

"People tend to think [I had everything I needed], but I had to work pretty hard to... to survive, basically, in Europe.

"I think the biggest thing was changing lives. You know, from one day to another one. Where I had a normal life in Mexico, I was 14 years old with my friends, with my family, to all of a sudden be on my own – totally on my own – for weeks in a country where I didn't even speak the language, where the weather is very different. Where the culture is different.

I mean, my life just turned around within a flight, 360 [degrees], and that was the hardest thing for me, the biggest shock I had."

But despite having doubts about the viability of the whole ▶

I believe that here are the best drivers. It's obviously harder for a Latin [American] to be racing in Europe. But it is where the best drivers are."

HARDER THAN YOU THINK

It's commonly believed Pérez's path to F1 was gilded with the money of Mexico's richest businessman, and one of the planet's wealthiest men, Carlos Slim Snr – but Checo can only laugh at that. Yes, he knew Slim since childhood through his father, but it was still difficult to make the case for a move to Europe. For his first season in Formula BMW Pérez had a minimal budget and lived above a restaurant owned by the team boss.

Jimmy Morales, the Escudería Telmex boss and a man who Pérez names, right after Slim, as one of those who played one of the biggest roles in giving him a career, said in one interview that finding the \$100,000 to send Checo to Europe was harder than accumulating \$10million when he was already in F1.

"Yeah, because you were asking for a crazy thing," agrees Checo. "Formula 1? No one knew about F1. And a kid asks for this level of money, for Mexico it was totally unusual.

"Yeah, he [Morales] was a big supporter of me. Although he



In his second year at Sauber Pérez scored three podiums, which led to a McLaren drive for the 2013 season

With the F1 exit door open, Perez's 2020 Sakhir GP win helped secure the Red Bull drive





“I DIDN’T GET CHOSEN FOR THE RED BULL PROGRAMME. YOU KNOW, IT’S TYPICAL HELMUT IN THAT REGARD. IF YOU DON’T GO AS FAST AS YOU NEED TO GO IT DOESN’T MATTER WHY. SO THAT’S PRETTY SIMPLE”

trip across the ocean, Checo did stick it out in Europe.

“The opportunity I had, you know, looking at how hard it was to convince Carlos to get me to Europe. I knew that if I were to go back [to Mexico] I would never be back [in Europe] again. So that was what really motivated me to stay.”

A couple of years later Checo did get the chance to secure a major European benefactor – one Helmut Marko. But evaluation for the Red Bull young driver programme didn’t go well.

“It was [arranged] through Escudería Telmex,” Pérez recalls of his F3 test with Red Bull. “They invited us to

do the test, somewhere in Portugal, I don’t remember where exactly. Basically these tests, it’s just to see who goes fastest over a lap. But that day, I remember, my seat wasn’t fitted properly, so I was hitting [the steering wheel] with my knees.

“I thought, OK, I do a run and then I adjust everything. But as I came back in, that was it! Basically it was only one run!”

A dozen years on from that inauspicious first encounter, Pérez would remind Marko of this story as he signed his first Red Bull deal – now in F1.

“It was just, yeah, how it happened,” Checo says, sweeping an imaginary object off the table, “I didn’t get chosen for the programme. You know, it’s typical Helmut in that regard. If you don’t go as fast as you need to go it doesn’t matter why. So that’s pretty simple.”

THE LONG ROAD TO PROVING HIMSELF

Since then Pérez has proven quite a lot of people wrong. First, those who doubted you could make it to F1 from Mexico: having finished runner-up in the 2010 GP2 Series

(now F2), he took a place on the F1 grid with Sauber. Also those who doubted he could stay in F1 long-term.

And there were plenty of these doubters – even among people you might have expected to support Pérez in his first great F1 career crisis, when he moved from Sauber to McLaren just as the Woking team’s form tanked. Jo Ramírez, a childhood friend of Ricardo Rodríguez and one the most prominent Mexicans



With Ramírez in GP2 in 2010. The pair fell out for a while after Pérez’s unsuccessful season at McLaren

in F1 history thanks to a diverse career which included being François Cevert’s chief mechanic and McLaren’s team co-ordinator, was critical of Pérez in the media for having a “wrong attitude” and “being arrogant”. It’s said that Pérez and Ramírez didn’t speak for many years afterwards. ▶



CHECO BECAME THE FIRST DRIVER IN MANY YEARS TO BOOK A PLACE IN THE MAIN RED BULL TEAM WITHOUT HAVING BEEN PART OF ITS JUNIOR PROGRAMME

Pérez claimed his fourth F1 victory in Singapore, though the stewards took their time confirming it

“I was disappointed in some ways,” Pérez recalls, “because when I was going through my toughest time in F1, let’s say, you would expect people – especially people that were close to me – to come and tell me straight, instead of going to the media and criticising me while I was fighting for my career. But it’s also part of the sport. I don’t take anything personal. What happens here is just... it’s just part of the sport.”

After being ejected from McLaren, Pérez also parted ways with manager (and former IndyCar driver) Adrián Fernández, who had brokered the negotiations that left Pérez with a one-year McLaren deal. It took several years for Pérez to be reconciled with both Fernández and Ramírez.

“I have no regrets with anyone, I moved on,” Pérez says. “I think we all moved on. We all learn from our mistakes and yeah, life goes on. And life is much more than Formula 1 at the end of the day.”

Having taken the lifeline of a drive with Force India

for 2014, Pérez essentially rebooted his career. Team insiders describe the diligence with which he knuckled down to learning how better to manage such nuances as tyre degradation. He began to shed his reputation for impetuosity, instead establishing himself as a consummate

midfield poacher who could maximise a car’s potential and bring home whatever points were on the table.

But when Lawrence Stroll’s consortium bought the team and then recruited Sebastian Vettel, a

four-time champion, it looked like Pérez’s time in F1 was up.

Then, in what might have been his penultimate GP, Pérez scored an unlikely victory. After an accident on the opening lap of the 2020 Sakhir GP Pérez was last, only to triumph in one of the most dramatic F1 races of the past few years.

“It just reminds you about your dream of becoming an F1 [driver], of having a successful career,” he says of that victory. “Winning in Formula 1, it’s something you want to know how it feels, you know? You don’t want anyone to *tell* you how it feels. And it was great. It was a great thing to achieve. It was also a crazy race. So that made it even more special.”

At that point he had no deal for the following year in place, and there seemed to be no vacancies. Checo admits now that he was ready for his F1 path to end. “It was my 10th or 11th season in F1. So it was really okay, if it was to end. I didn’t have much of a problem with it.”

But that race helped finally sway Helmut Marko. It had taken almost a decade and a half for Pérez to finally prove to Red Bull’s ‘driver advisor’ he was deserving of a place in the organisation – and Checo became the first driver in many years to book a place in the main Red Bull team without having been part of its junior programme.

“I guess that was the difference in taking someone from the outside to see how they adapt to the Red Bull philosophy,” Pérez says. “Because Red Bull is a massive brand with a way of doing things very different to any other F1 team. So it’s not guaranteed someone who isn’t used to that approach will adapt to it.

“It has worked out well. I’m on my second season, and I’m gonna extend my career with them for another two years. So it’s gonna be a much longer journey than we first thought.”

TARGETING A WIN AT HOME – AND THE TITLE

This year Checo Pérez will arrive at the Mexican GP as the most successful local driver in F1 history – in virtually every statistic. His Monaco victory took him above Pedro Rodríguez as the Mexican with the most F1 wins, and he added to that tally with an outstanding victory in Singapore. And it would be no exaggeration to suggest Pérez put his country back on the ►

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F1 map – because the return to Mexico City in 2015 wouldn't have happened without him.

"I didn't really think about it," he says. "But it was just nice to see, since I came to F1, how much it has grown in our country. And now the younger generations. they all think about F1, which is great, because in my time I had no one in F1."

While being popular and successful enough to bring a moribund grand prix circuit in your home country back to life and return it to the calendar is an achievement in itself, that isn't what Pérez set out to achieve. At Red Bull he has a competitive car at his disposal but also one of the most ferocious competitors on the grid in the garage next door. And Max Verstappen is also, indisputably, the team's priority. Still, Pérez hasn't given up on his own ambitions.

"I want to achieve my biggest dream, which is to become a world champion before I head back home," he says.

At the beginning of the season it appeared this unlikely-sounding scenario might actually play out, since he was much closer to Verstappen in terms of pace than he'd been in 2021.

"Definitely," Pérez says when GP Racing asks if these early races led him to think he had a chance to fight for the title. "Because I was fairly comfortable. And I was as quick as anyone throughout the weekend, constantly. And things were coming naturally at the time, so yeah, it was certainly... I did feel like I was in the battle."

This began to change as Red Bull developed the car, not just in terms of aerodynamic updates but also through a weight-loss programme which made it less prone to understeer. As a result it became more to Verstappen's liking and less to Checo's. Hardly surprising since the team has been built around Verstappen for seven years now and the engineers

Pérez's victory in Singapore was a timely reminder of why Red Bull chose him in the first place

"I WANT TO ACHIEVE MY BIGGEST DREAM, WHICH IS TO BECOME A WORLD CHAMPION BEFORE I HEAD BACK HOME"

naturally channel their efforts towards building a car that behaves as he wants it to.

"I think it's part of how things go," Pérez explains. "Sometimes you bring upgrades to the car, and it just helps, sometimes you bring upgrades and you're not as comfortable, but that's just part of F1. You're constantly evolving."

"We cannot take anything away from Max. He's extremely good, extremely talented. A very, very hard worker, and... he delivers when he has to, so there's nothing to take away from it. But yeah, at the same time, having the whole team around him in that regard certainly helps.


"It's not easy to beat him. But I've got to keep trying. I've got to keep improving. And I believe I can do it. I just have to make myself more comfortable. Like I was in the beginning of the year. And I've shown I can do it."

In any case, in his home race this year Pérez will have F1's best car at his disposal, since the RB18 has pulled clear of its rivals since the summer break. And for several years now Red

Bull has been the team to beat in the thin air of Mexico City. Pérez claimed a podium there last year and could now be in a position to challenge for the win. After all, the

different circumstances of this year's championship means it's unlikely Red Bull will feel the need to institute team orders at his expense if he's leading his team-mate...

"Great memories," says Pérez of last year's race. "You know, that race very much makes me think of everyone who has been with me since day one, also my family, my kids, so it's a very special race. You know, if there's a race when I really want to do well, it's definitely Mexico.

"The target is of course to win everywhere we go, but obviously Mexico will be the main one." 



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RED MISSED

HOW FERRARI'S CHAMPIONSHIP CAMPAIGN WENT UP IN SMOKE

After a decade of toil and missed opportunities, Ferrari began the 2022 season with possibly the fastest car on the grid. But it's still falling short of being a championship-winning team...

WORDS ANDREW BENSON PICTURES  **motorsport**
IMAGES & SHUTTERSTOCK



In the case of Ferrari's collapsed championship campaign this year, it's almost a case of choose your metaphor. It went off the rails; went up in smoke; imploded; fell apart – all apply literally and/or figuratively to a season in which hope and expectation have evaporated for myriad reasons.



Yet it all started so well. A close-fought win for Charles Leclerc in the opening race of the season in Bahrain, after a wheel-to-wheel scrap with Max Verstappen's Red Bull. A similarly competitive second to the world champion a week later in Saudi Arabia. A dominant victory – one of the most convincing all year, as it has turned out – in Australia.

Combine those with two retirements for pre-season favourite Verstappen in the first three races, and Leclerc left Melbourne with a 46-point lead over the man who was clearly going to be his only title rival.

With Ferrari's first competitive car for four years, and a driver who might just be the out-and-out fastest on the grid, things looked set fair for a glorious season. Surely Ferrari couldn't squander all that?

After that imperious victory in Melbourne, the sky seemed to be the limit for Ferrari. Instead, it will be remembered as the point from

which everything started to unravel.

Just three races later that advantage, which had looked so forbidding, was gone.

There had been a spin by Leclerc in the closing stages of the Emilia Romagna Grand Prix at Imola, as he struggled to separate Verstappen's team-mate Sergio Pérez from second place, and third place became sixth.

A close second to Verstappen followed in Miami, where Leclerc was hampered by higher tyre degradation. But it was Spain where things really started to go wrong.

After Verstappen had spun into the gravel and lost ground while chasing Leclerc early on, the Ferrari driver's engine failed while he was running away with the race.

Verstappen, recovering from his early error with the help of Red Bull imposing team orders on Pérez, took a third consecutive win. This meant that in just three races there had been a massive 52-point swing between the

two – Leclerc's post-Melbourne advantage turning into a six-point deficit to Verstappen leaving Barcelona. The momentum never really changed from that moment on.

A decade
of missed
opportunities

It's worth pausing here to put all this in context. The last decade or so hasn't been easy for Ferrari.

Back in the early years of the 2010s, the Scuderia twice came close to the drivers' title, only to lose out to Red Bull in agonising circumstances at the final race. In 2010 and

It was such a good start. Wins in Bahrain and Australia for Leclerc, combined with two Verstappen retirements, meant Charles left Melbourne 46 points ahead of Max



difficulties of 2020, that target became ever more important. So when the 2022 car was immediately competitive, it was a vindication of the work Ferrari had done under team principal Mattia Binotto to recover.

Ferrari knew it wasn't ready yet

Despite Ferrari's improved performance this year, Binotto has always been keen to manage expectations. On the eve of this year's Monaco Grand Prix, he granted an interview to *BBC Sport*. The purpose was to chart how Ferrari had clawed its way back to the front. But at the end of it, he made some remarks that drew attention to the team's situation.

Asked what Ferrari's mindset was having finally produced a competitive car, Binotto said: "We set our own objectives to be back to being competitive in 2022. So our objective is to be competitive and not to win the championship, and it would be completely wrong to turn that into 'let's try to win the championship because we are so competitive'.

"Being competitive is one fact, becoming world champion is another level of task, and we believe that to become world champion still it will take time.

"That is maybe to take off some pressure from the team but also because I think it would be wrong as management to change objectives to the ones we gave them.

"No doubt what we intend to do is to try to open a cycle – it's become world champion and ►

2012, it owed its position to a large extent to Fernando Alonso, whose consistent excellence had cars that weren't absolutely competitive in places they didn't really deserve to be.

When Alonso lost faith in Ferrari's ability to deliver him a third title, he left, and was replaced by Sebastian Vettel for 2015.

A restructure of the team led by the late Sergio Marchionne produced Ferrari's first absolutely competitive cars for 10 years in 2017 and 2018, but both times the team fell short, through a combination of driver and team errors, reliability problems and failing to keep up with Mercedes in the development race.

In 2019, Ferrari's chassis had slipped a little in performance, but the prodigious performance of its engine not only led to a run of six consecutive poles mid-season – five of them for then-new signing Leclerc – but also raised eyebrows up and down the pitlane.

After interventions from Mercedes and Red

Bull, the FIA issued a rule clarification on fuel-flow ahead of the US Grand Prix. Ferrari's qualifying run dried up, and its race pace noticeably slipped a little. Ferrari insisted this was nothing to do with the engine.

Over the subsequent winter, the FIA announced it had come to a confidential settlement with Ferrari. The governing body believed the Ferrari engine hadn't always been run legally in 2019 but couldn't prove it. Ferrari insisted its engine had never been operated outside the regulations.

In 2020, Ferrari's competitiveness slumped. Engine performance dropped and the chassis, designed in anticipation of a power unit with a lot more punch, had too much drag.

For a long time, the target had been to use the new technical regulations that F1 had been working on since Liberty Media took over from Bernie Ecclestone in 2017 as the springboard for Ferrari to return to the front. Following the

not only once, try to stay there. But I think it will take time.

“So our internal mindset is still we need to improve as a team overall to be capable of winning a championship. It doesn’t mean we will not do it. Maybe we will do it as soon as possible. But we are conscious of the fact that it is more than only being competitive.”

With the benefit of hindsight, those comments seem both remarkably accurate and uncannily prescient. But at the time, in the context of what looked like Ferrari’s first title challenge for four years, they caused quite a stir.

Binotto was interpreted by some as this meaning that Ferrari wasn’t trying to win the championship, which is not what he was saying.

The point he was trying to make was that Ferrari was on a curve aimed at returning it to a position of absolute competitiveness – and that he was aware the team wasn’t yet the finished article.

So while his words might have seemed defeatist to some at the time, in fact they were simply a statement of fact. It’s just that no one was quite aware at that point just how accurate Binotto was being. And even Binotto cannot have realised just how far Ferrari still had to go, or how quickly Leclerc’s title challenge would fall apart.

Blow-ups and bungles

Two days after that interview, Ferrari’s strategists bungled the Monaco Grand Prix, turning a lead for Leclerc in the fastest car on a track where overtaking is more or less impossible into fourth place.

After a wet start, they pitted him for intermediate tyres too late, having failed to see the time being gained on new intermediates by Pérez’s Red Bull, and lost the lead to the Mexican. Another strategic mistake at his second stop for slicks put Leclerc to the back of the leading group, losing out again to Red Bull, and vaulting Verstappen ahead of him.

Meanwhile, in what was to become something of a trend, Leclerc’s team-mate Carlos Sainz over-ruled the team’s strategists from the car, took matters into his own hands, rejected the call

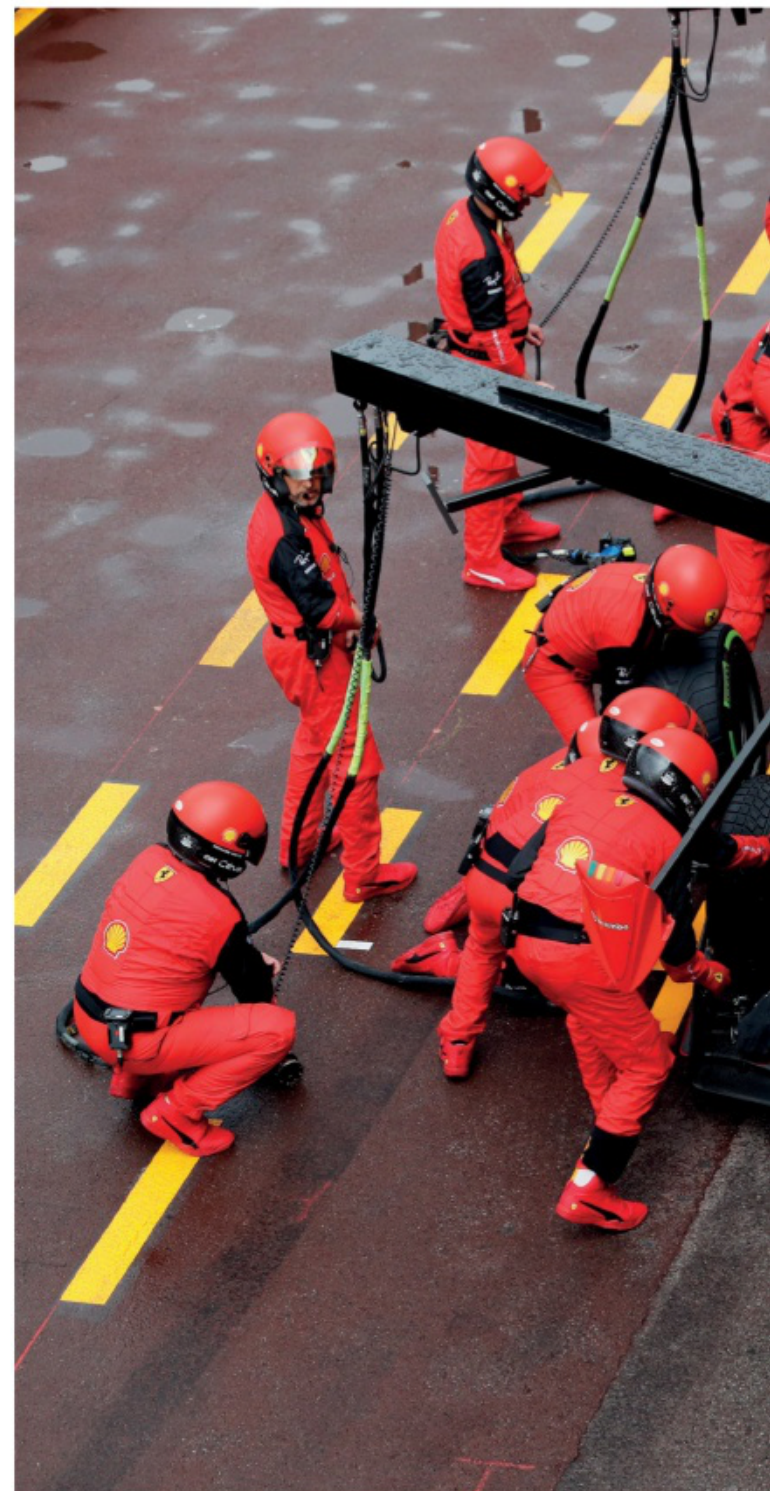


“We need to improve as a team overall to be capable of winning a championship. It doesn’t mean we will not do it. We are conscious of the fact that it is more than only being competitive”

MATTIA BINOTTO

for intermediates, and finished second.

A distraught Leclerc managed to keep it together in his post-race interviews, but even being polite the message was clear. “Sometimes



mistakes can happen,” he said, “but there have been too many mistakes today.”

The following race in Baku gave Ferrari a chance to make amends. Again Leclerc was on pole – his fourth in a row. He lost the lead at the start to Pérez, but an early stop, taking advantage of a Virtual Safety Car, got him to the front and set the pattern of the race. Verstappen would be coming back at him with a tyre offset. Who would win?

An engine failure – Leclerc’s second in three races – before half-distance rendered the question academic. Again Verstappen won. Now Max’s advantage was 34 points, and for Ferrari the season had taken an alarming turn.

It has continued that way ever since. The two engine failures led to a grid penalty in Canada for Leclerc, already past his season’s allocation long before the halfway point.

There were more strategy failings at the next race in Silverstone – first, by failing to advantage



How costly was this litany of failures? If you add up all Leclerc's problems so far, they have cost him between 103 and 144 points, depending on whether you give him or Verstappen the wins in Baku, Paul Ricard and Hungary.

At the time of writing, ahead of the Singapore Grand Prix, Leclerc is 116 points behind Verstappen. Had it not been for all the problems that have hit Ferrari this year, Leclerc could be anything from leading by 28 points, if you give him those wins; or trailing by just 13, if you give them to Verstappen.

Out of that multitude of errors, two completely are down to the driver – the crash in France and the spin in Imola. They cost Leclerc a total of 32 points. The rest are at the door of the team.

And that's without factoring in the effect of all those problems on Leclerc, how much faith they must have cost him in the team, and how much that might have fed into the mistake he made in France. ▶

Ferrari messed up its strategy in Monaco, pitting Leclerc too late for intermediates (left). Sainz (below) ignored the call and finished second

Leclerc in the early stages, and leaving him stuck behind the slower Sainz; second in failing to pit Leclerc under a late Safety Car, and leaving him exposed on old tyres. That turned a win into fourth place. At least Sainz won in his place.

Austria next time out showed what Ferrari was capable of when things went right – a dominant win for Leclerc, better than Red Bull in every way, superior on pace, tyre degradation and strategy. But then France. It was shaping up into a reverse of Baku, Leclerc staying out when Verstappen pitted early, only for the driver to err this time, and crash.

A grid penalty for Verstappen in Hungary gave Ferrari an opportunity to repair the damage, but yet again it self-harmed. The team mismanaged the weekend, failed to read on Friday that the hard tyre would not work, and put Leclerc on it when he was leading mid-race. He slumped down the field from the lead, while Verstappen won from 10th.



Losing the development race

Since the summer break, the picture of the season has shifted again. Red Bull has surged ahead on performance. While during the first half of the season, competitiveness between the two teams was finely balanced, now Red Bull looks unbeatable.

In one sense, then, Ferrari can afford to lay off the regret. From Belgium onwards, Verstappen looked so imperious that Leclerc was probably going to lose this year anyway, regardless of Ferrari's operational management and reliability. But that conclusion raises another question – how has Ferrari's performance tailed off so suddenly?

There has always been an offset between the Ferrari's pace in qualifying and race. Over one lap, it has been on average the fastest car on the grid – at least in Leclerc's hands. That's not the case in the grands prix.

Ferrari had seven poles in 11 races from Bahrain to Austria and its qualifying advantage over Red Bull was 0.176s over the first half of the season. The run from France to Italy brought that down to 0.016s. It may well be, the way things are going, that the Red Bull will overtake the Ferrari as the fastest single-lap car by the end of the year.

But races aren't won over one lap, and pace over a race distance paints a different picture. Up to Hungary, the Red Bull was probably on balance the faster race car, but it was close.

Red Bull probably had the edge in Saudi Arabia, Imola, Miami, Azerbaijan, Silverstone and Hungary; Bahrain, Australia, Monaco, Canada and Austria leant to Ferrari, with Spain and France too hard to call.

"We still have good pace in qualifying, so the pure performance is still there, but in the race pace we are suffering tyre deg and in that respect the Red Bull is a better car" MATTIA BINOTTO

But since the summer break, it has been all Red Bull. Ferrari has been nowhere, struggling with both pace and tyre degradation.

So what's gone wrong? Binotto says he doesn't know: "In the last races, the performance of the Red Bull has been better than ours," he said after



Another pole for Leclerc in Baku, but also another engine failure – his second in three races – and Verstappen started to pull away



Sainz won at Silverstone, but even this victory had issues, when Leclerc – who had led the race around half-distance – was left out on old tyres



Monza. "Not in qualifying. We still have good pace in qualifying, so the pure performance is still there, but in the race we are suffering tyre deg and in that respect the Red Bull is a better car.

"They have been capable of developing that car for a better balance and better tyre degradation

ways in which this year's cars have been troubled with vertical oscillations. The key elements are a metric that defines a maximum permitted level of bouncing; and a series of changes aimed at preventing underfloor planks flexing.

The plank is attached to the bottom of the floor and is used as a means of controlling ride height – if it wears too much, the car is disqualified, so the plank prevents teams running the cars too low.

In the first part of the season, both Red Bull and Ferrari are known to have had planks that flexed upwards into a cavity between them and the bottom of the monocoque. Mercedes, meanwhile, did not. This feature is regarded to be effective in managing the underbody airflow disruption that causes porpoising.

The ruling introduced at Spa prevented planks flexing in this way. By Hungary, Red Bull insiders were saying it thought it had found a way to adapt



France was a disaster, but it wasn't of the team's making. Leclerc was distraught after he spun out of the race when leading...

Austria showed the team was still capable. Leclerc dominated the whole weekend at Red Bull's home track to cut the deficit to Verstappen



the car to minimise its impact. Is it possible that Ferrari has not been so successful in this?

In Spa, rivals noticed with interest that Sainz was warned at various times to avoid certain bumps – as if Ferrari's engineers were concerned about staying within the oscillation metric.

Meanwhile, Red Bull has been developing its car, particularly through reducing its weight. Verstappen cites this as the main explanation for why his form in particular has improved so much as the season has gone, relative to Pérez.

In the first part of the season, Verstappen says, the car was overweight – and overweight in the wrong areas. This made it lazy and understeer-prone – characteristics Verstappen abhors. In shedding weight, the car has come alive for him. This has liberated development in a direction that suits him – and he has been able to exploit more speed because he can drive the way he wants.

Time is running out

This year has been a sobering one for Ferrari. It has succeeded in returning to competitiveness. But doing so has laid bare the fact that as a team it has made little progress on weaknesses that killed off its 2017 and 2018 title campaigns.

This has not gone unnoticed among the decision-makers in Italy. In September, ahead of the Italian GP, Ferrari chairman John Elkann gave an interview to *Gazzetta Dello Sport*.

Ferrari had "great faith" in Binotto, Elkann insisted. But he added a caveat. "There is no doubt that the work in Maranello, in the garage, on the pitwall and at the wheel needs to improve.

"There are still too many mistakes when it comes to reliability, driving and strategy. Putting our trust in Binotto and his team was the right decision and it has paid off. Thanks to them we are competitive and winning again. But I am not satisfied because I think we can always do better."

For Leclerc, this is his first experience of a year of Ferrari falling short in this way. And for now he retains the belief that Alonso eventually lost.

"I know how tough it's been the last few years to get back to where we are," Leclerc says. "I know we arrived to that level because for two years we have been working on those weaknesses.

"So we still have weaknesses and we need to work on them. But if we work as well as we did in the last two years on other weaknesses, I am confident that we'll overcome them."

Andrew Benson is BBC Sport's chief F1 writer



JOST CAPITO

Last season, the first under Jost Capito's leadership, Williams escaped the bottom of the constructors' championship – but the team scored most of its points in the chaotic Hungarian GP and the 'race' at Spa. This year Williams is propping up the standings again, but its team principal says that isn't the whole story...

Jost, last year you finished the European season with 20 points and eighth in the constructors' championship. A year later, you left Monza in last place with six points. But is it a case of the results not telling the true story?

Yeah, the points don't show the progress we've made. I think last year we were good on strategy with changing weather conditions, and that gave us the points in Hungary and Spa. So far this year there's been no races where, let's say, you could have different [strategy] choices.

This year you've had to earn all your points.

I think last year we earned the points as well, it wasn't luck that we scored them. But such situations didn't occur this year. Also, there's new regulations, we had to build a completely new car. And I, FX [Francois-Xavier Demaison, recently installed technical director] and, let's say, anybody who is new hasn't been there when Williams developed a new car.

We had to see how the processes are, where the lags are in the processes, and also invest in the infrastructure to efficiently develop the car. And this didn't come into effect for this year's car. We have our objectives for where we want to be at the end of the season, independent of championship position or points. I think we are on a good way to achieve those.

What are these objectives?

There is a lot of, as I mentioned, internal infrastructure, the processes we implemented internally, an ERP [enterprise resource planning] system just got set up in August, that takes a year or two to come to fruition fully because you need to establish it in various steps. Now it's about utilising these systems and bringing them all up

to speed. And if you have that, then it will show in car performance. If you get more efficient, also under the cost cap you can develop more because you're more efficient. Our objectives for next year are based on these internal processes and efficiencies.

The team announced it will part ways with Nicholas Latifi at the end of the year. Frankly, from the outside, it seemed like a no-brainer. But was it like that?

It's always difficult. I've seen how hard he trains, how much effort he puts in. He's a nice person as well. It's always hard to have these kinds of discussions with somebody – and at my age these kids are like sons. And that makes it even harder. Nicky drove three years for Williams, we had a good time together and we agreed the objectives: what kind of performance had to be achieved, and I think Nicky wasn't happy with not achieving these objectives and neither was the team. So on both sides, it's time for a change.

Was it important for you to have Nicholas this year, as a reference point for Alex Albon, because you knew how he compared with George Russell?

This is very difficult to do. Because we don't really know – and also Nicky doesn't know – how much

Abu Dhabi last year [where Latifi's crash affected the outcome of the title fight, and he received death threats on social media] really affected his driving. That was very hard for him. I really feel sorry for him that this happened. It must have had an impact.

How long did it take for Alex to convince you he's the right driver for you?

We saw it as soon as he got in the car. You see how he reacts, how he develops the car, how he gets integrated in the team. He's the right guy.

Is this why you removed him from the market as soon as Sebastian Vettel's retirement triggered various other moves?

If you go into the summer break and the driver isn't clear he has a drive for next year, and other teams approach him... I wanted to take this pressure off him before the summer break, that he knows we want him.

Money has always been a big topic for Williams in recent years. The car still looks a bit naked in terms of sponsor logos...

Does it? I wouldn't say so! We have good discussions [with sponsors], and we're fine, we're happy where we are.

But you're losing Nicky as well, and it's known he came with some backing. Can that become an issue? Because in the recent past Williams always lacked money.

Yeah, but not anymore. We get sponsorship [money], and we're announcing new sponsors, too. And also the owners are happy to invest. So we're operating towards the cost cap. And that's all we can do.

**WE HAVE OUR OBJECTIVES
FOR WHERE WE WANT
TO BE AT THE END
OF THE SEASON**

THE TRACKS OF MY YEARS

The official 2023 Formula 1 calendar, published at the end of September, features 24 tracks. Exactly half of them, in one way or another, bear the fingerprints of **Hermann Tilke** and his company. From clean-sheet designs to modernisation of existing layouts, Tilke – now working with his son Carsten – is F1’s go-to architect. *GP Racing* stopped by the company’s Aachen HQ to find out what goes into creating new tracks – including next year’s hotly anticipated Las Vegas venue

WORDS OLEG KARPOV PICTURES EVGENY SAFRONOV



Carsten Tilke grabs a piece of Las Vegas from the shelf. It’s one part of a model of the forthcoming track in the world’s gambling capital. “You see the Bellagio?” he asks, drawing *GP Racing*’s attention to the miniature of one of the world’s most famous hotels, along with its 8.5-acre man-made lake and the fountains which dance to music every 15 minutes during the evening. “Here it is. And the fountains.”

The 3D printer, housed in one of the rooms of the Tilke Engineers & Architects building in Aachen, is yet to produce the rest of the circuit mock-up. It’s a busy piece of equipment: models which emanated from it adorn much of

the three-storey office of the company, located in one of the alleyways next to Krefelder Strasse on the outskirts of town, near New Tivoli Stadium, where the local football club Alemannia plays its matches.

Next to the chunk of Nevada on the shelf are details of various other Tilke projects – mostly the recent ones.

“This is Jeddah. See, the last corner,” says Tilke Jr, grabbing another square object from the shelf.

“The media island is here,” smiles Tilke Sr, indicating the state-of-the-art edifice, a small part of the substantial infrastructure project involved in staging the Saudi Arabian GP. ▶





GETTING ON ECCLESTONE'S RADAR

Hermann Tilke's company now employs 150 people, mostly designers and engineers. He founded it back in 1983, having just finished university. Six months as an office-based engineer left Hermann feeling he wasn't getting enough time for his hobbies – Tilke raced in various GT championships – and he quit, instead setting up shop in his own kitchen.

The hobby would lay the foundation for a successful career. Hermann raced a lot at the Nürburgring and offered his services to the track. "I knew they needed to do some things, so I just went to the management there and said, 'Hey, I'm here, I can do this.' First they were sceptical, but then gave me the job."

First, a 600 Deutsche Mark gig to refurbish a small safety road. A few more projects after that, pitwall reconstruction among them. And then, finally, a massive commission to put together the new Mercedes-Benz grandstand. That one would facilitate a meeting which changed his life.

"That was how Bernie [Ecclestone] found out about me," recalls Hermann of his introduction to Formula 1's legendary 'ringmaster'. "He saw the grandstand and asked, 'Who's done this?' and they said it was somebody from here. So he wanted to speak to me. And I was there too, but on a grandstand. They called me and said, 'You have to come', and it was the first time I got into an F1 paddock."

The rise was meteoric. Soon Ecclestone put Tilke in touch with people from the Malaysian government, and in 1999 F1 arrived at Sepang – an autodrome that became a calling card for Tilke and effectively made him F1's go-to track designer. From that moment on, any entity who wanted to have

a new F1 track built was directed towards the designer from Aachen.

The tracks in Bahrain and China arrived on the calendar in 2004. Ecclestone appreciated that Tilke could be tasked with a project of any difficulty level. In Shanghai Hermann built a track around swampy ground, in Bahrain he did so in the desert, in record time.

"In Bahrain everything was scheduled for 1 October," he recalls. "And then Bernie called me and asked, 'Is it possible to have it ready by April?' I said, 'I don't know, I'll come back to you tomorrow.' And next day I read in the newspaper the April date was confirmed. So we had to live with it. It was also very tight, this project, but in 14 months we managed to build everything."

Next up were projects in Istanbul, Singapore, Valencia and Abu Dhabi. It was during the time Tilke worked on the latter that his company grew to 200 staffers, because of the sheer size of the project.

But Tilke isn't limited to just F1. His company's projects include hotels, residential areas and shopping malls. Yet auto racing and anything to do with the automotive industry are still the main focus. "Lot of tracks we're doing, people don't really know about," says Carsten Tilke, "because it's club tracks or tracks for the automotive industry. We're doing a lot of testing tracks, Porsche experience centres as well. We did seven out of the nine Porsche experience centres. Not only in Germany, but also the one in Japan at the moment, for example."

RUNNING IN THE FAMILY

Carsten joined his father's company eight years ago. When Hermann was establishing himself as F1's foremost circuit specialist, Carsten was still a teenager. "I was with Hermann a lot of times at different racetracks, also because he was racing himself," he says. "We had a small flat rented at the



The Mercedes-Benz grandstand (top) that got Tilke noticed. Baku (above) and Jeddah (right) have been difficult recent projects



Nürburgring. So I spent some weekends there as he was racing. I could always bring a friend. A lot of times we came to see him racing, but they usually retired after a few laps! Anyway, it was fun."

Naturally, motorsport became Carsten's passion as well. But his father was initially reluctant for him to join the family firm.

"He started racing himself," says Hermann, "and he wanted to do this [design race tracks] as well. I said, 'Please, think about it, maybe it's better to be a lawyer or a doctor or whatever,' but he still chose this. After studying in Munich, he finished his PhD, became a doctor, and a few years later he joined us. First he was sitting downstairs, with



Tilke Sr smiles at the memory: “Yes, she was involved too. She said, ‘No way, cobblestones must remain there.’ And I had to convince her that we’d find the way to put the asphalt on top for the race and then remove it without any damage. First she said, ‘I don’t believe you,’ but agreed in the end.”

ANSWERING THE CRITICS

A high profile can also make you a target. When F1 takes heat for boring races and a lack of overtaking, Tilke’s is usually among the first names on the blame list. It’s often said his tracks insufficiently challenge the drivers, offer few overtaking opportunities, or that their layouts are too generic.

“Yeah, criticism, when you read it, sometimes it can be a little bit painful,” says Hermann. “Sometimes it’s right. But most of the time we have some borders we cannot cross: if you have this land, you can only use this land. But what I will never agree is that all our tracks are the same. That’s simply not true. The only thing they all have in common is a long straight. But that’s it.”

He offers up the new Jeddah street circuit as an example of a venue which is nothing if not difficult for drivers.

“You can say it’s an answer to all the critics who say the new tracks are boring and not challenging,” Hermann says. “This is a really challenging track. And the drivers... I saw [Charles] Leclerc last year, when he got out of the car. He sat on the tyre, he was totally exhausted.”

Certainly nobody disputes the challenge of the Jeddah track in particular, but that venue has also proved to be an incident magnet – some of them frightening – and the drivers have been vocal about safety issues such as inadequate sightlines in quick sections. Entering an area ‘blind’ at high speed can exacerbate even minor incidents, such as when

Hermann with son and partner Carsten (above). The company employs around 150 people in its office in Aachen (left)



but the track would go to the other side. And it would have been easy to do it there. But boring.”

“Yeah, 90-degree corners only, not so nice buildings anymore, mostly skyscrapers,” says Carsten. “So, for the city, for the country to show itself, it wouldn’t be that good. But we had this other project, the difficult one. So in the end we sat together and they just said to us, ‘What should we go for? You tell us,’ And we said, ‘We need to fight for the difficult one.’

“There was an easy route to say ‘Let’s do it like this’ in the other part of the city. We would have saved ourselves a lot of headaches, a lot more effort, but we just had to do it, because we wanted to create something cool.

“I remember when we walked the future track together with [former FIA race director] Charlie Whiting. First he said, ‘Urgh, this is crazy, we

can’t,’ and then, ‘but we have to.’”

Hermann adds: “Also people in the office, when we came back with some photos and everything... We showed it all to our engineers, and they said ‘Ooofff, it’s not possible.’”

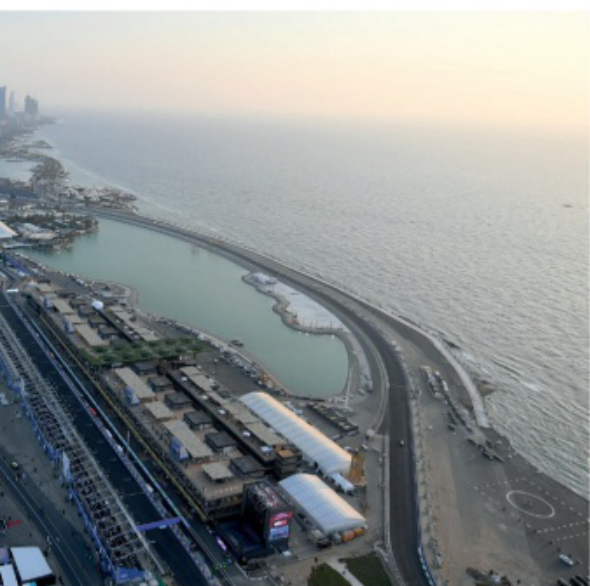
“I was there two times at night, three or four o’clock when we closed the roads and placed cones there,” continues Carsten. “Turn 15, the one where a lot of drivers now do mistakes and go straight, was the most difficult, because the run-off was only possible in one direction: we have the building there, which cannot be shifted. So we had to close the streets there during the night to figure out, with cones, the best way to shape the corner. We thought about making a chicane, but it was simply too narrow.

“There were a lot of challenges... And Hermann had to speak to the wife of the Azerbaijan president about cobblestones in the old town.”

the engineers. Now he’s a partner.”

The first F1 undertaking Carsten worked on with his father was the street circuit in Baku – and it proved a challenge.

“We had different possibilities,” says Hermann. “And most of them were very boring. They were in a different part of the city. The paddock would have been the same,





“STREET TRACKS ARE ALWAYS DIFFICULT, THERE ARE A LOT OF THINGS TO THINK ABOUT. FIRST OF ALL, VERY IMPORTANT IS THAT PEOPLE SHOULD BE ABLE TO ACCESS THEIR HOUSES, SO YOU CAN'T JUST CLOSE THEIR PART OF THE CITY”

one car spins and another arrives on the scene unaware. Tilke continues to work with the FIA to satisfy the drivers' demands, prioritising the highest-speed sections of this rollercoaster track, moving walls away from the racing line.

“I think, the layout itself is fast and really demanding,” says Carsten. “Also the drivers, as far as we've spoken with them, they like the layout itself. It's cool, it's fun. But of course, we're now getting the feedback and we're improving it, from year to year, to have better visibility, because of course it shouldn't be dangerous.

“But we try to keep the layout as much as possible. It produces cool races, it's fun for the drivers. But it's also difficult, because we just had this small strip of the land, so everything had to be very compact.

“It was approved by the FIA to have it like this. But after every race

Hermann with a 3D model of Las Vegas, the company's most pressing project. A number of staff are already in residence there...

you get smarter. It's important to get feedback and to react on this feedback. So for us it wasn't that we said, ‘Oh, we did a mistake.’ It was more like, ‘OK, we did it and everyone was fine with it. But now we know more and we'll try in this direction to make it better.’ And this is a normal process.”

Another sore subject for Tilke is that of track limits. As the years have passed, Tilke projects have featured fewer and fewer gravel traps – but it's not because the company has an asphalt run-off fetish. There are powerful business arguments for getting rid of gravel traps, and not just the angle pushed by Ecclestone, who felt that by

eliminating cars from the running in a grand prix they potentially diminished the overall show. Most tracks have to run as businesses, which means laying on events for other days in the year when the grand prix circus isn't in town. So while you could argue that asphalt run-offs have had the unintended consequence of encouraging F1 drivers to take liberties with track limits – because there's no gravel to get stuck in – there is a net benefit to tracks' overall business.

“To have gravel next to the track is totally nice for F1, because we all agree it's nice when you don't

have track limits and mistakes are punished,” says Carsten. “But you have a lot of private drivers and clubs coming [on track days], and people driving their Ferraris or Lamborghinis or whatever. And for them it's a nightmare, because if stones get on the track, they need to clean it. Otherwise cars get damaged. And if a car gets in the

The lack of gravel at circuits such as Abu Dhabi (below) has a benefit on track days. Malaysia (far right) and China (right) were early Tilke tracks





gravel, they have to throw a red flag, reducing the track time for the other people there...”

Tilke Sr rises and makes his way towards a map of a current F1 track that shall remain unnamed.

“Here,” he points to one of the run-off areas. “This is asphalt, and FIA doesn’t want it, they want to have gravel. But the client says, ‘No, no, no, we have normal drivers, a lot of track days, and they are destroying their cars. We have to keep it like this.’ And I can understand them.

“The modern cars, street cars, some of them you throw it in the

gravel and you have a repair invoice for five, six, eight thousand.”

WHAT HAPPENS IN VEGAS...

Tilke’s next big challenge is the Las Vegas street circuit, set to host the penultimate round of the F1 season in November 2023.

Some of his employees are already in permanent presence at the location, while Carsten flies to Nevada every three-to-four weeks to monitor progress.

“From the beginning of next year

it will start to be very interesting,” he says. The Tilkes will need every ounce of their experience to pull this one off.

“Street tracks are always difficult,” says Hermann. “There are a lot of things to think about. First of all, very important is that people should be able to access their houses, so you can’t just close their part of the city. Then you always need a vehicle bridge to the inside part, because there could be an emergency. If someone needs an ambulance it needs to be able to get there without stopping the race.”

It’s a trial on a completely new


level. With the Vegas GP, F1’s goal is not just to put on a show, but to become ingrained in Vegas’s everyday hustle and bustle. It has to coexist with a 24-hour money-making machine whose operators want the event to complement rather than detract from the cash being poured into slot machines or pushed across green baize.

“In Las Vegas, we have the biggest hotels of the world in the middle of the circuit,” says Carsten. “The Venetian, with over 6000 beds. And next to it is the fourth biggest hotel. We have so many hotel rooms inside the circuit and around it, plus one of the liveliest streets in the world, the Las Vegas Boulevard... We need to make as little disturbance as possible for the casinos, for the restaurants, for shops. We need to organise ourselves very well in terms of setup time, in terms of making everything go smoothly. And this is the biggest challenge in Vegas.

“We have less time to do everything than we normally have. And everything needs to work all the time. People need to feel not compromised by the race. It’s an addition for them, it’s an additional huge show.

“I think everyone would love to be there. So many people already calling me, every week, asking if I can organise some hotel rooms there. Because everyone wants to be there.

“But we have to make sure everything goes smoothly and nobody later complains too much, ‘Oh, I couldn’t go there because everything was closed.’ And this is a huge challenge.”

There probably will be those who’ll still find cause for complaint. But it’s unlikely there’s anyone out there better suited to reconciling the complex demands of the Las Vegas stakeholders than the father-son duo who persuaded Baku’s leaders it was possible to lay temporary asphalt on those historic cobblestones... 



ZHOU GUANYU

Alfa Romeo's Chinese rookie made a stunning start to his F1 career with a debut point in Bahrain but reliability then hampered his attempts to build on that score. However, he's been quietly impressive against Valtteri Bottas and recovered rapidly from a huge shunt at Silverstone, all while carrying the massive expectations of an emerging Formula 1 nation

Congratulations are in order with the contract extension news – was it ever in doubt you'd be continuing with Alfa for 2023?

To be honest, no. I mean, there was a doubt at the beginning of the season because I didn't know how my first rookie season would go. But, actually, it went pretty smooth. The team is very happy with the objectives we were able to achieve. And also showing the potential – mainly from my driving. Yeah, I think halfway through I felt like there's a big chance or a high chance to continue with the team. And [I'm] really looking forward to all the new challenges we're going to be facing.

The team says it's really impressed with your work ethic and how you've integrated well with the engineers. How did you do that?

From my side I feel lucky to be joining the team – because Alfa Romeo really knows how to build up a young generation [of drivers] coming from Formula 2, junior single-seaters. And I really felt that this year. They've been extremely helpful and motivated me, and I got a warm welcome to the team. Everything seems to be going well. I've been quite happy and learning quite a lot, and been through a massive step. There's a lot more potential to come, but so far I've felt very settled in this team.

Alfa has also highlighted your contribution to improving its at-base simulator. What exactly did that involve?

This year we did a lot of sim work. In fact, last

year I was in the sim even on 24 December, one day before Christmas. We just put effort into it, trying to review how the real car feels and adapt that into the virtual space. Also, in terms of development, getting the laser scan of the track more accurate is key. Especially this year, with the new car and new aero rules in F1, there are a lot of things we've done.

How important was scoring a point in your debut race? Did it take some of the pressure off?

Yeah, that was pretty much the most intense race I've had in my whole career. Because I had a lot of pressure coming into this season. I never doubt myself and the team never doubt me. So, to do that in the first race is a dream coming true. The first Chinese driver to be entering a grand prix and the first points for my home [country] – that is a very historic moment for my side. So I was very emotional after the race, that's for sure. It's a day to remember for my whole life.

Did your big accident at Silverstone have any lingering after-effects?

WE SEE DRIVERS DO A BIG STEP IN YEAR TWO/YEAR THREE SO, HOPEFULLY, I'LL BE ONE OF THEM AS WELL

Yeah, of course there's a bit of an injury effect, but definitely it was much less than you'd expect given what the incident looked like. I felt very lucky to benefit from the safety improvements by F1 and the FIA over the years and, of course, the halo – that was the part which saved me on the day. It felt lucky to walk off and to be straight back to racing the next week in Austria. It's definitely not the best moment – not something I want to remember, and I try to forget what happened – but overall, before that, I was in a very good rhythm in terms of just improving. I'd had back-to-back Q3 attempts [Montreal and Silverstone] – which was something quite special for me.

Looking to the final races of this year and then on into 2023, where do you think you can be better?

There's a lot more to come. Just to be getting to know the tracks [has been a factor so far]. There were a few new tracks for me at the beginning of the season and now [coming to the season's end] most of the tracks are new again – apart from Abu Dhabi. So there's been a lot of learning this year. Also, for me to get familiar with how a Formula 1 driver has to work as a professional. It's tough for your debut campaign and it always takes a bit of time. We see drivers do a big step in year two/year three so, hopefully, I'll be one of them as well. I'm looking forward to next year. What I achieved this year isn't going to be enough in 2023 so I need to do more, keep exploring more of myself.

**Thanks to Puma for facilitating this interview*





TOP THE HISTORY OF TYRRELL OF THE PART 3: 1970-71 WORLD

Becoming a constructor in his own right would enable Ken Tyrrell to keep Jackie Stewart and Ford together, and claim two more world titles – but it had to be done in secret...

WORDS MAURICE HAMILTON PICTURES



When Tyrrell finally became a constructor it was fitting that the first win, at the 1971 Spanish GP, went to Stewart

The Tyrrell Racing Organisation had a new and impressive transporter. The only problem was, it had nothing to put in it. Incredible as it may seem, the reigning world champion's team found itself going into 1970 without a car to defend the title. Simply put, the obduracy of international automotive politics was allowing no sympathy for a man and his small racing team operating out of a woodyard in Surrey.

Ken Tyrrell's association with Matra and Ford had ticked every box on the competition blueprint thanks to Jackie Stewart winning six of the 11 grands prix in 1969. But success was to come at a price. In a typically convoluted series of buyouts, Matra had been taken over by Simca and the French manufacturer's parent company, Chrysler, was more interested in global image than the ingredients necessary to remain a consistent grand prix winner. It clearly did not suit the Chrysler Corporation in Detroit to continue having a car powered by an engine carrying the name of Ford, another of the so-called 'Big Three' automobile manufacturers in the United States. If Tyrrell wished to continue using the sure-footed Matra chassis – which Ken assuredly did – it would have to carry a Matra engine in the back.

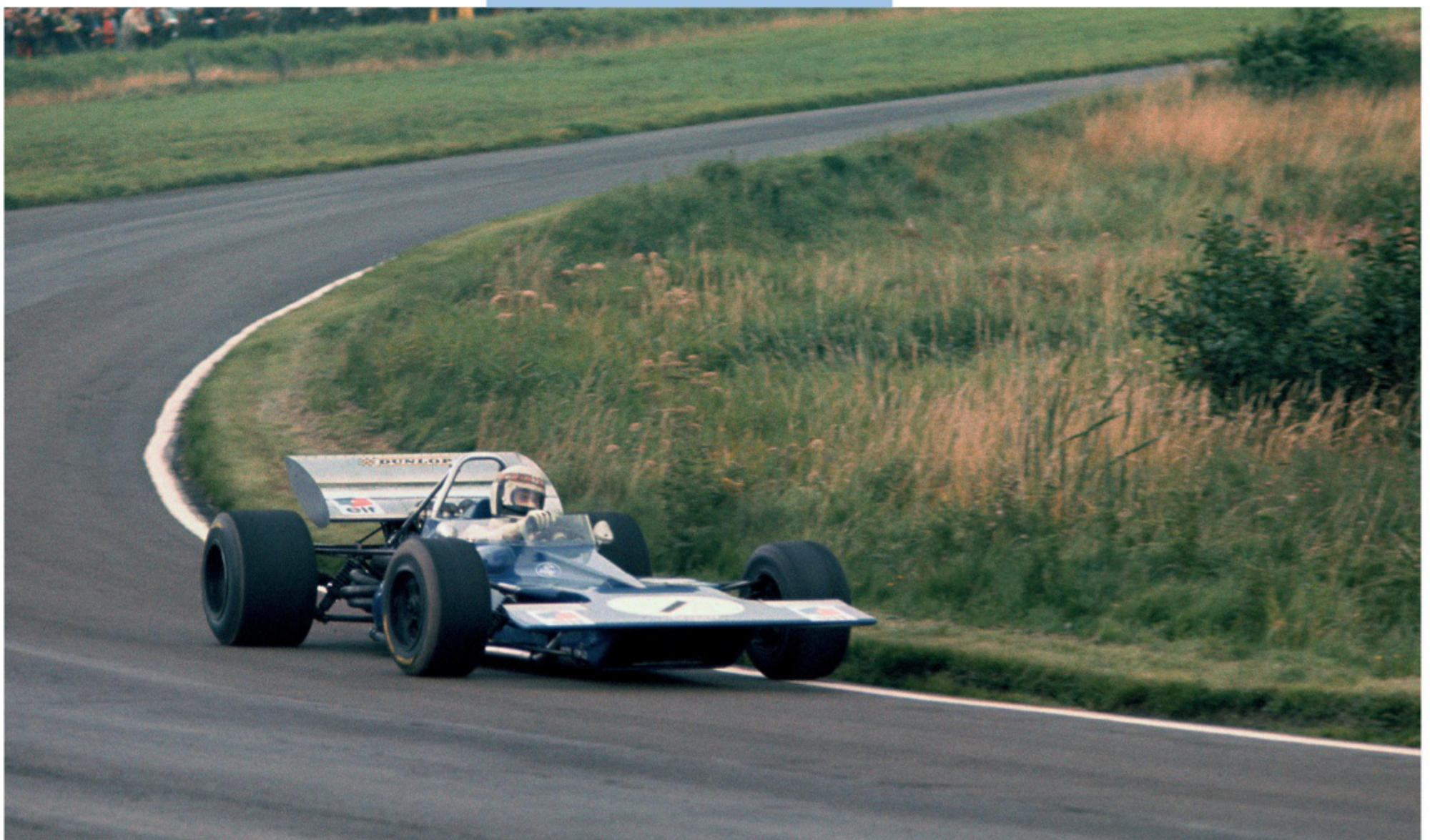
The Matra V12 had first appeared at Monaco in 1968 and had done nothing of note ever since. When Stewart tested the Matra F1 car at Albi in France in September 1969, his worst fears were confirmed. The V12 was smooth and nicely engineered – but lacked the aggressive grunt of the Ford-Cosworth DFV. As Stewart said: "Without a competitive engine, the best car in the world is going nowhere." Ironically, Stewart and Tyrrell now faced the reverse of that scenario; they had a competitive engine – but nowhere to put it. It was no surprise that the most obvious suppliers of a decent chassis, Brabham and McLaren, also ran the DFV and weren't keen to service the one team likely to beat them with identical equipment. Salvation – of sorts – was to come from a most unlikely source.

Max Mosley was part of a consortium cheerfully, if rather naively, taking on the

motorsport world. The former barrister and F2 driver was the 'M' in March; an amalgam of the initials of four directors behind audacious plans to build and race cars in F3, F2, CanAm and, even more remarkably, F1. The March 701 grand prix car would be available to whoever wished to buy one. By default, Ken Tyrrell found himself at the head of a very short queue. March couldn't believe its luck.

Tyrrell bought three rolling chassis. The price for each was £9,000; how that figure was reached depended on who you spoke to. In 1980, Ken told this author he had only wished to pay £6,000 and refused to budge when Mosley insisted on the £9,000 price tag. According to Tyrrell, Max then persuaded Walter Hayes, vice president of Ford of Europe, to meet the difference rather than lose a driver of Stewart's calibre to a rival engine manufacturer. In 2015, Mosley recalled: "We had worked out from our budget that £6,000 would be a profitable price. Walter Hayes, who had arranged for Ford to pay for Tyrrell's chassis, called me to his Regent Street office and said the price was £9,000. Not £6,000. I said: 'We can't possibly do that – we've agreed £6,000 with

The first outing for the 001 was the Oulton Park Gold Cup in August 1970, when Stewart broke the lap record





Feeling Matra's V12 engine would be uncompetitive, Tyrrell opted to retain Ford power and buy March 701 rolling chassis for 1970



Tyrrell with the 001's designer Derek Gardner (above).. Gardner was on hand as the car made its world championship debut in Canada (right)



Tyrrell.' His reply was: 'Leave Ken to me. It's £9,000.' If he had not done that, March would have folded within the year."

As it was, March would barely survive its first season, thanks largely to the 701 being, at best, a mediocre car. That didn't appear to be the case when, in an astonishing debut in the South African GP, Stewart put the blue March-Ford on pole with the red works 701 of Chris Amon alongside. Tyre trouble may have dropped Stewart to an eventual third place but, to the outside world, Tyrrell had made a clever choice with the March 701 when Stewart won the Race of Champions and then, against all apparent odds, the Spanish GP at Jarama. But Ken knew Jackie had been forced to wrestle the 701 around Brands Hatch during the non-championship race, and the win in Spain had come largely through Tyrrell's renowned reliability and only five of the 16 starters reaching the finish. By the time F1 returned to Brands Hatch for the British GP in July, even the normally placid Amon had declared the 701 to be "a heap of shit".

Stewart retired from the British race. Finishing a creditable seventh in his third GP, François Cevert was beginning to repay Ken Tyrrell's trust when he had chosen the Frenchman based



Stewart with Cévert (left) at the Dutch GP in 1970, where the Frenchman replaced Jonny Servoz-Gavin as the Scot's team-mate

on his performances in F2. For Cévert, it was a case of simply taking the March 701 for what it was. Stewart, of course, thought different and had written off 1970 in what was turning out to be a truly dismal season as Bruce McLaren and Piers Courage lost their lives, compounded by Stewart's close friend and Swiss neighbour, Jochen Rindt, being killed during qualifying for the Italian GP. The following day, Stewart steeled himself and brought the March home a joyless second at Monza. The only note of optimism on that September afternoon was that he would soon be rid of the unloved 701. Something quite extraordinary was happening in the depths of Surrey and in a modest family home on the northern fringe of Royal Leamington Spa.

Ken Tyrrell felt he had no option but to build his own car. It was not something he truly wished to do but, having made the decision, the next most difficult step would be finding a designer – and keeping it all secret. Following a trend that would ultimately be a development cul-de-sac, Tyrrell had briefly run a four-wheel drive Matra MS84 in 1969. This had brought him into contact with Derek Gardner, a studious Englishman who specialised in transmissions. In the summer of 1970 they met in a quiet pub where, in a typically forthright manner, Ken asked Gardner if he would be capable of designing a F1 car. After

giving the question serious thought, Gardner decided that he could and quit his job with Harry Ferguson Research. Now the cloak-and-drawing-board business began.

A Hewland gearbox and Ford DFV were spirited to Gardner's home in Leamington Spa, where he constructed a wooden mock-up in his garage. Parts were ordered through a ghost company set up by Gardner. With the drawings complete, Tyrrell had the aluminium monocoque manufactured by Maurice Gomm, the highly regarded chassis specialist in Surrey who, allegedly, requested his handful of employees to swear on a bible; such was the aura of secrecy surrounding the project.

The car, designated Tyrrell 001, was completed

in the team's wooden shed. Its location in the woods at Ockham suited the need to avoid prying eyes. Amazingly, no one within the close-knit Formula 1 community had an inkling although, in August, some did wonder why the normally thrifty Tyrrell had suddenly chosen to fly his mechanics back from European races rather than travel by road. With a self-imposed deadline looming for the launch of Tyrrell 001 on 17 August, the team of no more than a dozen mechanics and technicians was flat out.

The blue car was duly unveiled before a group of disbelieving motorsport writers in the showroom of Dagenham Motors in London's Regent Street. Blue had been chosen in respect of Stewart's Scottish heritage – a colour which

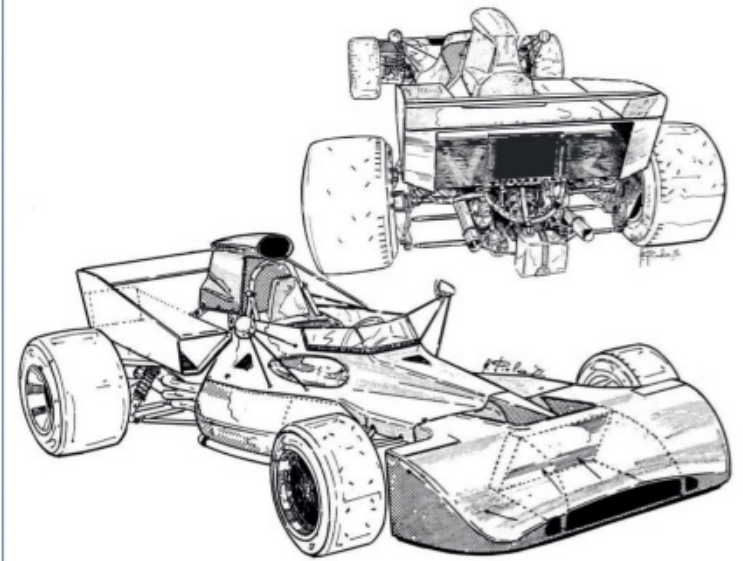
A HEWLAND GEARBOX AND FORD DFV WERE SPIRITED TO GARDNER'S HOME IN LEAMINGTON SPA, WHERE HE CONSTRUCTED A WOODEN MOCK-UP IN HIS GARAGE



Stewart knew that the 001 was good and put it on pole for its debut in Canada (above) and led for 31 laps until a stub axle broke

One of Stewart's six wins in 1971, on his way to his second world title, was at Silverstone and was his final F1 victory on home soil

Ken happened to like and one which also suited Elf. Through the foresight of the French state petrochemical company's head of promotions, François Guiter, Elf had previously supported Tyrrell (along with Matra). For 1971, that liaison would grow even stronger when the team would be entered as 'Elf Team Tyrrell'. In the meantime, Guiter was as keen as everyone else



The 001 was developed into the 002 – for Cevert – and the 003 (above) - for Stewart, with the larger front wing and air box

to take a first look at this secret creation.

Tyrrell 001, with a distinctive bulbous shape and a blade-like nose cowl above a shark-mouth air intake, had cost £22,500 (including engine and gearbox). This was a tidy sum in 1970. But would it be money well spent? The answer would come a few days later at the non-championship Gold Cup meeting at Oulton Park. A snared throttle cable and an engine failure were not enough to prevent Stewart from breaking the lap record and commenting: "The car felt good. It was forgiving. I could work with it."

But not yet good enough to race at Monza the following weekend when Stewart had his last outing in the March 701. Despite niggling problems with 001 during practice for the Canadian GP, Stewart claimed pole position on the bumps and dips of Ste Jovite and led for 31 laps before a stub axle broke. An oil pipe melting against the exhaust brought retirement at Watkins Glen, while the final race of 1970 ended when a shocking breakdown of crowd control led to Stewart hitting a stray dog. Four retirements in a row – but 001's potential was obvious.

In the interim, Tyrrell had an unexpected problem when his successful association with Dunlop was ended by the British firm's sudden withdrawal, leaving Firestone to potentially rule the roost. Stewart immediately proved his worth



When Dunlop surprisingly withdrew from Formula 1 at the end of 1970 Tyrrell, with Stewart's help, switched to Goodyear

in another direction by flying to the USA and using high-level contacts to convince Goodyear to turn around its sagging F1 fortunes by working with Tyrrell.

Tyrrell and Goodyear launched a relentless test programme at Kyalami in which Stewart completed up to three GP distances each day and put 986 miles on one DFV before it was returned to Cosworth in Northampton. During this and a subsequent 500 miles of running, Goodyear would fly out a succession of new tyres based on Stewart's comments and produced overnight in Wolverhampton. Meanwhile, Gardner had moved his office into a Portakabin near the door to 'The Shed', from which emerged Tyrrell 002, four inches longer than 001 to accommodate the much taller Cevert. Tyrrell was good to go.

1971 appeared to get off to a very good start when Stewart came home second in South Africa. The first finish for a Tyrrell was offset by an element of misfortune for others, plus the Scotsman's displeasure with the car's handling and the sight of Cevert's crashed 002 being

returned on the back of a truck. Added to which there was a growing fear that the DFV's days may be numbered when 12-cylinder Ferrari and BRM engines between them won the first four races (the South African GP and three non-championship events). For the next round of the championship, however, Tyrrell had produced 003, which incorporated myriad improvements.

Stewart was about to put the new chassis to good use at Montjuïc, a spectacular 2.35-mile track using public roads plunging and rising through a park overlooking Barcelona. The 75-lap Spanish GP turned into an epic fight between Stewart and Jacky Ickx, who led the first five laps in his Ferrari before running wide slightly. That was all Stewart needed to squeeze alongside the Belgian as they headed, at 175 mph, for a brow preceding a downhill plunge. It was an exceptionally brave move since the two cars became airborne briefly before getting hard on the brakes, with Stewart on the inside for the hairpin at the bottom of the hill. These two were in a league of their own: Ickx lapped one second



Stewart was imperious at Monaco in 1971. He won the race, in the yet-to-be-updated 003, driving all 80 laps with almost no brakes

faster than his pole time as he pressured Stewart in the final stages. It would be the first win for the Tyrrell marque, and Stewart went on to regard this as being comfortably one of his top-10 drives.

Stewart would also win the next GP at Monaco. Glamour and kudos aside, this drive would be just as meritorious as Spain – but for very different reasons. The mechanics had been flat out for 10 days straightening a badly damaged 003 after a stuck throttle had sent Stewart into a grass bank during the International Trophy meeting at Silverstone. All seemed to be in order at Monaco when Jackie claimed pole but, as he completed the single lap to the grid, Stewart knew he was in trouble. The front brakes were locking, and a quick examination revealed that a joint on the brake balance bar had unwound. With the adjuster buried at the base of the brake pedal, there was

GARDNER HAD MOVED HIS OFFICE INTO A PORTAKABIN NEAR THE DOOR TO 'THE SHED', FROM WHICH EMERGED TYRRELL 002

no time to fix it. Stewart would have to tackle 80 laps with virtually no rear brakes. The fact that he won with scarcely a puff of smoke from the front Goodyears would say everything about Jackie's skill, sensitivity and an ability to drive around a problem as critical as this.

Come July, Stewart might have been leading ►

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the championship, but Gardner feared the 12-cylinder engines would be superior on fast tracks such as Paul Ricard and Silverstone. This led to developments which, at face value, looked the antithesis of slick aerodynamic work. Gardner produced a rounded, full-width nose, a massive structure compared with the chiselled features of the Lotus 72. He also added an airbox, a development tried without success by Lotus and Matra. The difference was that the Tyrrell airbox, although comparatively clumsy and drag-inducing, provided a proper seal to the V8's inlet trumpets. When Stewart and Cevert finished one-two in France, there were claims of illegal fuel, an oversized engine – anything to explain such a crushing performance. Nothing was found to be amiss. Airboxes quickly became *de rigueur*.

Three races later, at the Austrian GP



Victory for Stewart in France – and a team 1-2 – was followed by wins in Britain and Germany which set up his second world title




In Austria Stewart emerged unhurt from a violent accident, after a driveshaft broke, to be crowned world champion with three races left



Stewart, Gardner and Tyrrell took the Tyrrell Racing Organisation to double title success in its first full year as a race car constructor

on 15 August, Stewart was declared world champion for a second time. The Tyrrell Racing Organisation had won the constructors' title 12 months after launching its first car, a truly remarkable achievement by any standard. An editorial in *Autosport* hailed Ken Tyrrell as "the most effective team manager in Grand Prix racing, who had the courage to have his own cars built when no one else's fitted the bill." In many ways, this would be the zenith for the Tyrrell Racing Organisation.

There would be more glory days during the next two years. But a shockingly sad end to the Tyrrell/Stewart/Cevert trinity would mark the beginning of a gradual decline for this substantial team working out of a small shed. 

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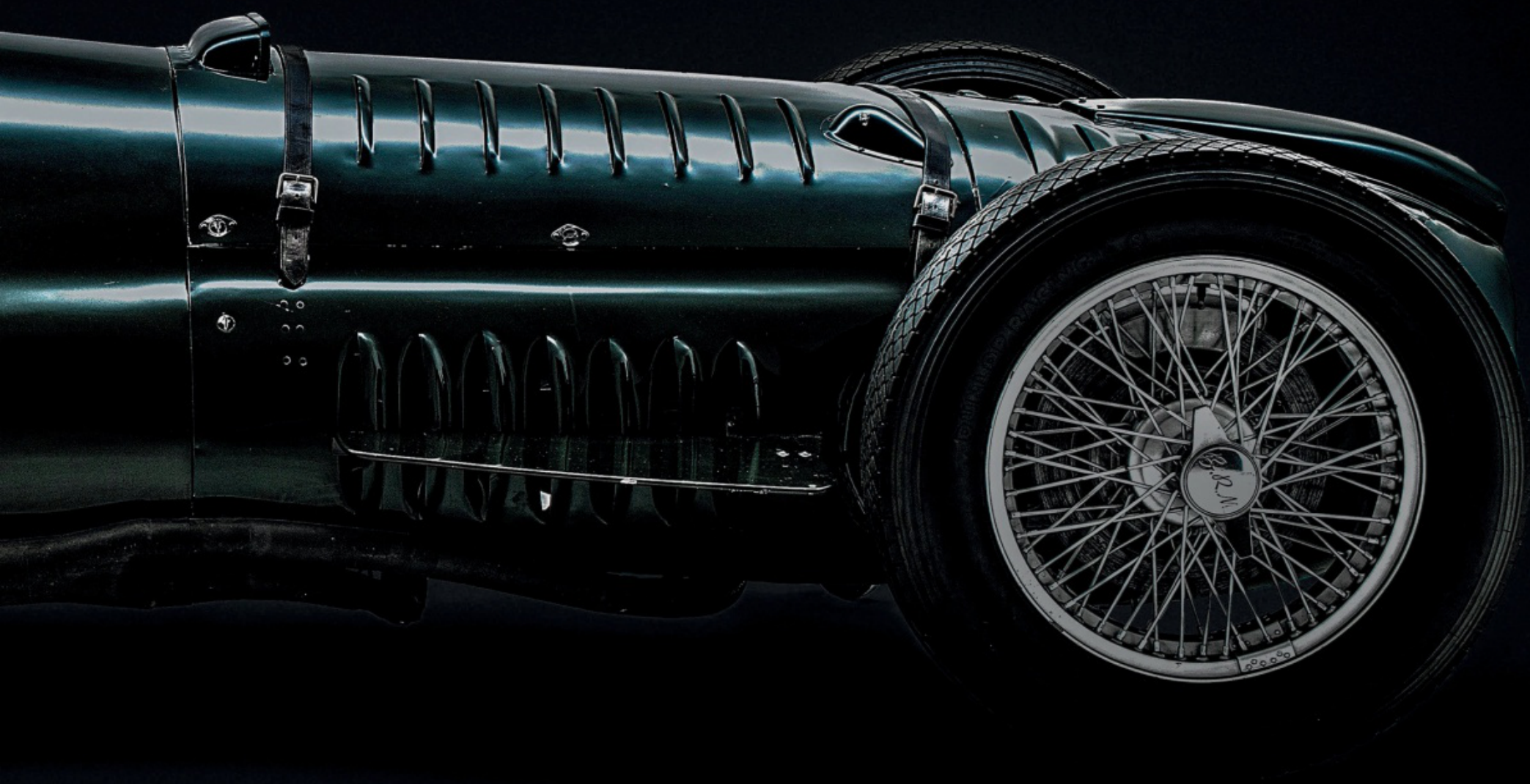
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DRIVE TO REVIVE

It was supposed to be the all-British Formula 1 car to beat the best of its continental rivals. But the technically ambitious BRM Type 15 flopped so badly it led to the world championship being contested by F2 cars for two seasons. 70 years on, a British engineering specialist with connections to the original BRM team has built a fourth chassis from the original blueprints – can it beat the likes of Ferrari second time around?

WORDS KEVIN TURNER PICTURES JAMES MANN AND BRM





STIRLING MOSS DESCRIBED IT AS THE WORST RACING

car he ever drove and it killed the first version of Formula 1. But the BRM Type 15 still has a special place in motorsport history, one that is being underlined by the unworldly scream of its supercharged V16 once again turning heads at the world's racetracks.

Thanks to the Owen family, which has owned BRM since 1952, the newly built chassis IV made its race debut at September's Goodwood Revival and the crowd-pleasing V16 is set to compete at selected events in the years to come. That's if, or when, leading historic preparer and builder Hall & Hall can get on top of a few issues – a phrase which has a familiar ring...

The brainchild of Raymond Mays and Peter Berthon – who had tasted success before World War II with their English Racing Motors project – British Racing Motors had a famously difficult start. The patriotic Mays had persuaded many British companies and business leaders, initially and importantly Oliver Lucas of Joseph Lucas Ltd and Alfred Owen of the Rubery Owen engineering company, to support the endeavour with funding and parts, but it proved a logistical nightmare. Material shortages and delays in post-war Britain meant the car wasn't ready for the newly instigated world championship in

May 1950, *five years* after Mays' 'White Paper' had kicked things off. Instead, the crowd at the British Grand Prix – which included King George VI – had to be content with Mays essaying a handful of demonstration laps.

Publicity around Britain's first proper F1 project was massive in the specialist press and beyond, further support came from the BRM Association supporters' club and the pressure for it to take on the Italian dominance of grand prix racing became unstoppable. Forced into running before it was ready, the V16 disgraced itself on its competition debut at the British Racing Drivers' Club International Trophy at Silverstone in August 1950 when the back axle output shaft sheared on the startline, with Raymond Sommer at the wheel. As the car was wheeled away, some of the crowd expressed their disgust by tossing pennies into its vacant cockpit. Two minor, though uplifting, victories at Goodwood followed in the hands of Reg Parnell, but the complexity of the 1.5-litre, two-stage supercharged, 135-degree V16 made unreliability a persistent problem, which in turn hampered work on other areas, such as the dubious handling.

STIRLING MOSS: 'ONE AND DONE'

Rising star Moss drove the Mk1 V16 in late 1951 and early 1952, during the time the car switched from drum brakes to discs to become the first GP machine to run the technology that would soon become *de rigueur*. Moss liked both the gearbox and the stopping power, even compared with the pacesetting Alfa Romeo 158/159 he tried at Monza while testing the BRM, but not the road-holding. As well as steering issues and a lack of front grip, Moss also found the power delivery somewhat challenging. Centrifugal supercharging meant the power kept coming as the revs rose (beyond 500bhp and towards 600bhp depending on the day, far in excess of any rivals), rather than reaching a peak and then falling away again as with the more common Roots-type versions, which could result in excessive wheelspin. Or the engine broke, as it did frequently.

"This is a classic example of a small concern convincing itself it was Mercedes-Benz and going into the high-technology racing car business deeper than either its competence or finances would allow," said Moss in *Stirling Moss: My Cars, My Career*, written with Doug Nye. That's perhaps a little harsh and it should be remembered that Moss's experiences with

the project came before the Board of BRM Ltd agreed to sell BRM to Alfred Owen at the end of 1952 and the subsequent refining of the V16.

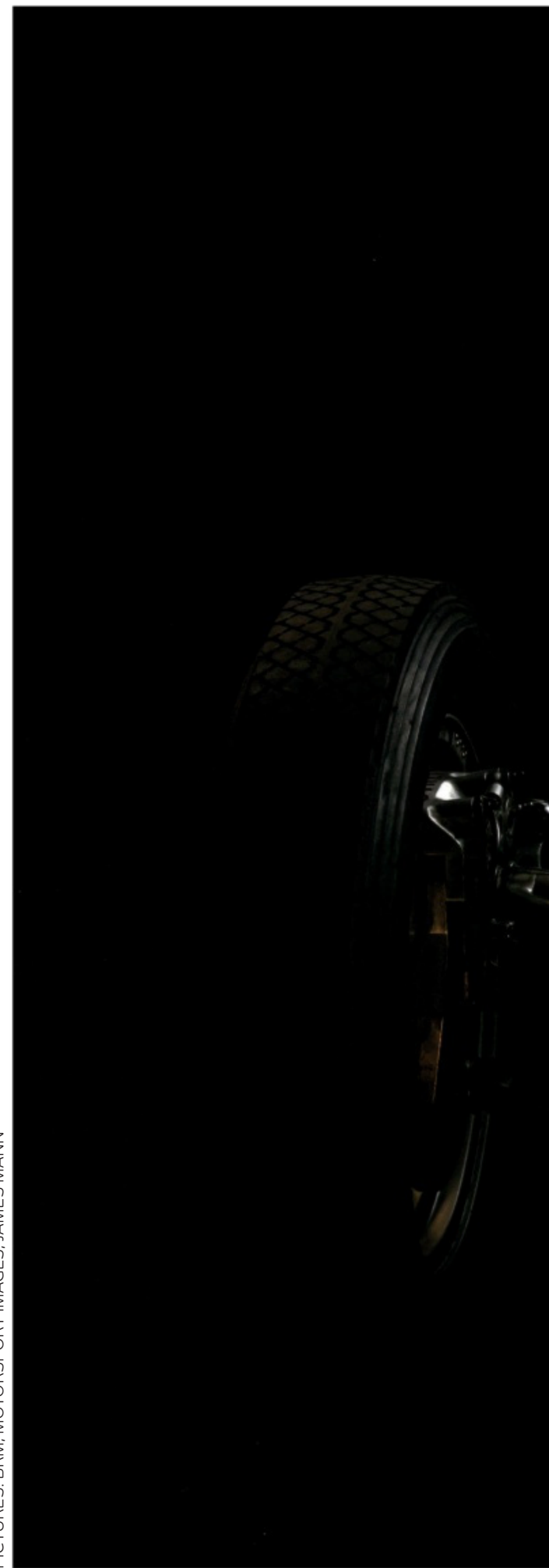
Possibly also relevant is that Moss's one race start came at the fearsome Dundrod road circuit, a venue considered dangerous (and soon abandoned) even in the 1950s. It's unsurprising Moss decided to have no further involvement soon after that disastrous outing, in which



The BRM board inspect a sculpture of the original Type 15 V16 (above). The 'new' fourth chassis finally got to race at Goodwood in 2022 (below)



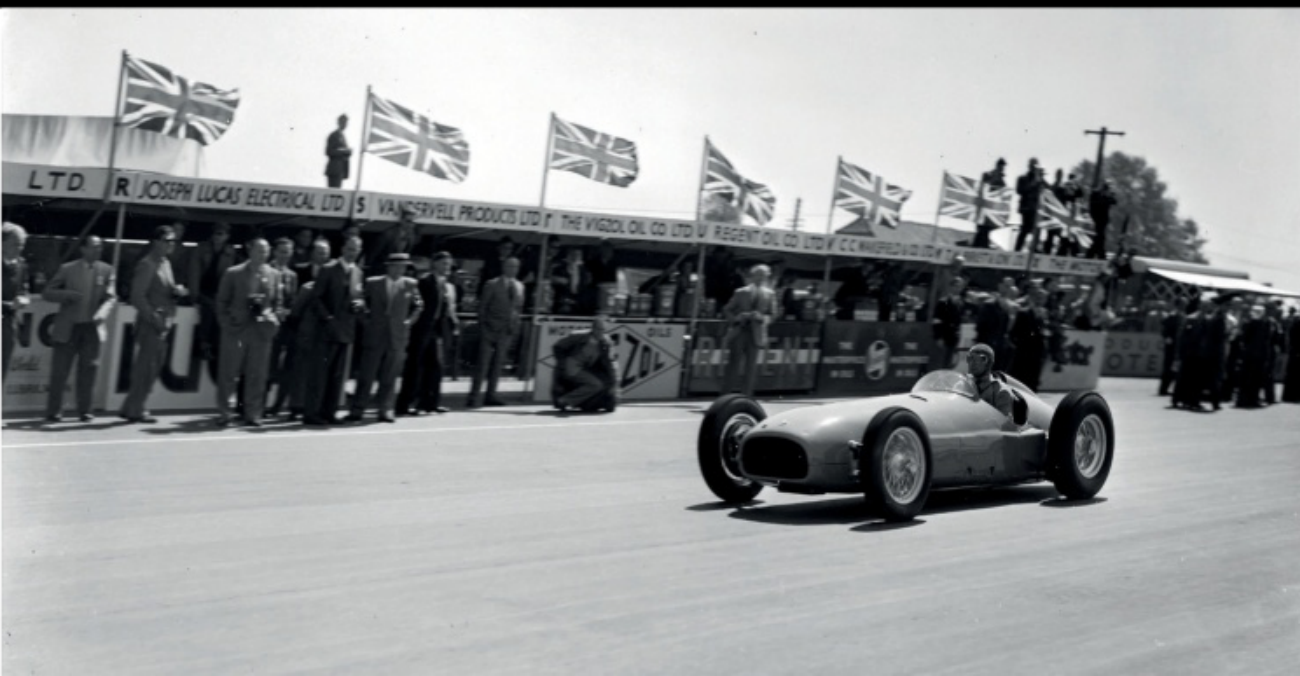
PICTURES: BRM; MOTORSPORT IMAGES; JAMES MANN





**“THIS IS A CLASSIC EXAMPLE
OF A SMALL CONCERN
CONVINCING ITSELF IT WAS
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RACING CAR BUSINESS DEEPER
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OR FINANCES WOULD ALLOW”**

STIRLING MOSS



The V16 wasn't ready for the first world championship GP, only managing a few demo laps in the hands of Raymond Mays

neither he nor reigning world champion team-mate Juan Manuel Fangio finished.

By then, the BRM debacle had already had an impact on the world championship itself. Parnell had finished fifth in the 1951 British GP, picking ▶

up the car's only F1 points, and team-mate Peter Walker was seventh. But the car's continuing lack of readiness was underlined by Parnell being five laps behind winner José Froilán González, and the fact that both BRM drivers suffered from burns, blisters and being gassed in the cockpit. The team failed to start any other races in 1951.

When BRM entered and then withdrew from the Valentino GP in April 1952 – before any world championship races had been held that season – many viewed it as the end of F1's last chance. Veteran Luigi Villoresi won the race in a Ferrari 375, Formula 2 Ferraris completed the podium and everyone else was nowhere. Mays' decision to bring the cars back from a Monza test to allow Fangio to try the V16 in the UK, instead of allowing the team to race in Turin, essentially

killed the very formula for which the BRM had been devised. "BRM always wanted an extra day or two to make the result different," opined Moss.

THE (TEMPORARY) END OF FORMULA 1

The combination of Alfa Romeo's withdrawal and BRM's flakiness meant race organisers turned to the F2 regulations, for two-litre unsupercharged cars. Ferrari still dominated but at least grids could be filled, something that could not be said for F1. The world championship was switched to F2 for 1952-53, ahead of a new 2.5-litre unsupercharged F1 ruleset for 1954.

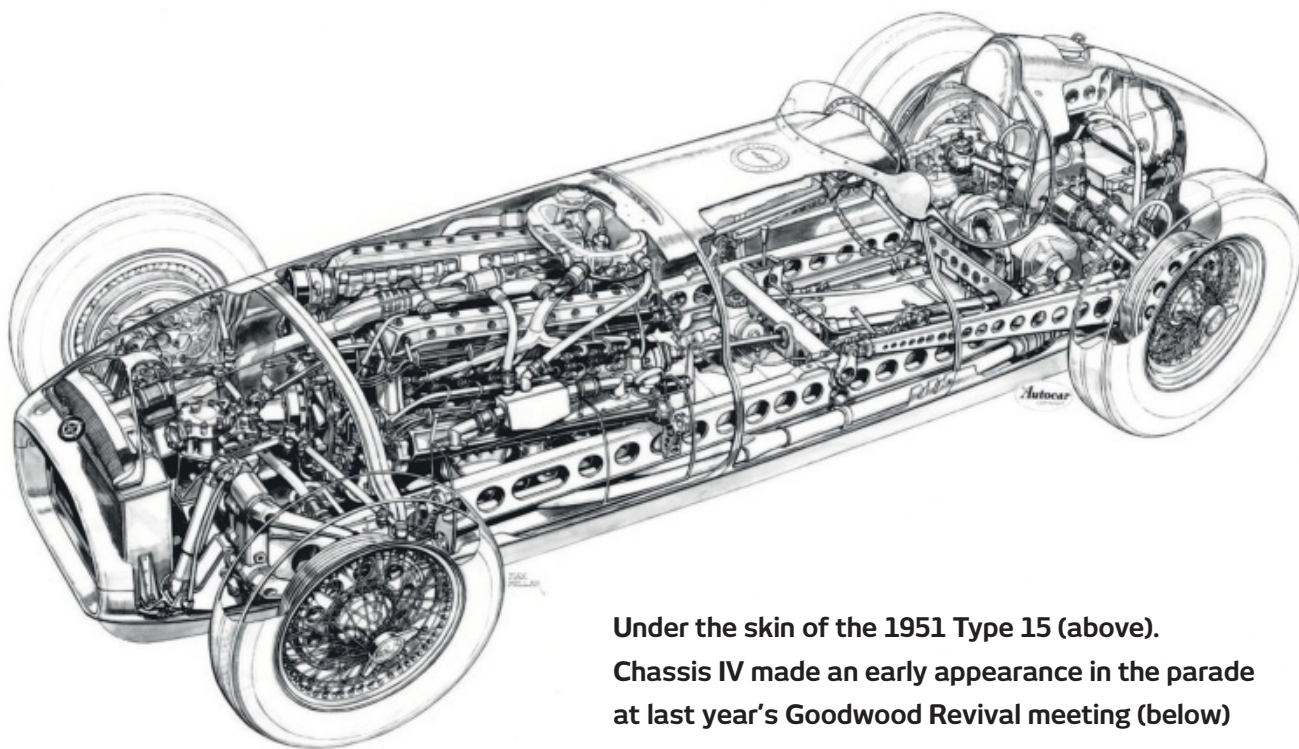
From that moment, the BRM V16 could only be classed as a failure because it could no longer

achieve its makers' aims: to conquer the world. And yet, development continued, under Owen's ownership and with Tony Rudd, who would later play a big role in BRM's 1960s F1 success, becoming more involved.

By 1953 things were looking better, which was underlined by the three V16s that made the trip to the non-championship Albi GP, being run for F1 and F2 cars. Ranged against world champion Alberto Ascari's Ferrari 375, still the formula's benchmark, Fangio put his V16 on pole by 2.9 seconds. The Argentinian led their heat and it was the pursuing Ferrari that wilted, leaving Fangio to lead a BRM 1-2-5 with Ken Wharton and González. With Ascari out, BRM should have walked the final, but the tyres of the day weren't up to the prodigious performance of the

PICTURES: BRM





Under the skin of the 1951 Type 15 (above).
Chassis IV made an early appearance in the parade
at last year's Goodwood Revival meeting (below)



V16s – thought to touch 200mph on the fastest parts of the course – and all suffered serious left-rear failures. Fangio controlled his wayward car (which Mays then reckoned to be capable of producing 585bhp at 11,800rpm), Wharton crashed, while González salvaged second after two stops for new rubber that left him 31s behind Louis Rosier's victorious Ferrari 375.

In terms of raw pace, the P15 had finally proved itself against Ferrari. "Albi was the turning point," wrote Mays. "It was one of the greatest moments of my life." Though it is perhaps ironic – or fitting – that, even in its finest hour, the V16 hadn't actually won.

Fangio is reputed to have called the V16 "the best F1 car ever made" and said that "no car has ever given me such a thrill to drive". That was an enormous boost to Mays and there's a letter supporting the story, though Fangio was also known as one of the sport's great gentlemen.

The Mk1s and the two shorter-wheelbase Mk2 P30 V16s *did* win races through to 1955. These were in relatively minor, UK-based events, but they did prove the V16 could be made to work – and the battle with the Thin Wall Special, the Ferrari-based unsupercharged 4.5-litre car run by former BRM supporter Tony Vandervell's operation, provided a fine spectacle. For a brief period the two camps could claim to have the fastest road-racing cars in the world and held several outright lap records.

The V16s also helped spur on the British motor industry, laying the foundations for the success that continues today, and eventually proved they could take on the next generation of F1 cars. For example, Wharton battled Roy Salvadori's Maserati 250F in the 1954 Glover Trophy at Goodwood and took victory after the new car hit trouble. "It was a magnificent piece of machinery – a car never to be forgotten," Mays concluded.

But, as far as the world championship history books are concerned, the V16 has just two points to its name and failed to end the Italian hegemony. British success would have to wait until Vandervell's Vanwalls were perfected and Cooper kickstarted the rear-engined revolution towards the end of the decade.

BACK TO THE OLD FUTURE

The rarity, complexity and cost of the originals has precluded much serious running in the years since BRM's attention switched to the far simpler P25 and the V16s were retired, which is where the Owen family and Hall & Hall come in.

John Owen, son of Alfred, remembered seeing the V16s at Goodwood as a lad. He wanted to recreate the spectacle and pushed to build a new ►

car. “We found Car Development Committee minutes that said the plan was to build six Mk1 V16s,” says Paul Owen, Alfred’s grandson. “They built three, then the regulations changed, so they didn’t build the other three.” Completing the original allocation seemed rather appealing...

The Owen family has put a lot of effort into bringing BRM to the forefront of people’s minds in 2022, the 60th anniversary of the team and Graham Hill taking an F1 title double. “Part of the reawakening project is to tell the story, introduce it to a new audience and go racing,” continues Paul. “We thought what better way to do that than build another one. It’s a truly spectacular sound that can hopefully inspire the next generation and bring back memories for those who heard it in period.”

It was a massive project – there were 22,000 original drawings – but with Hall & Hall’s expertise, things moved quickly despite the COVID-19 pandemic. “Because there was no racing we could get stuck in to the V16,” says Rick Hall, who worked at BRM in the early 1970s and has driven all the V16s. “But some of the material we wanted – it was like history repeating itself after the war when materials were short.”



Nevertheless, the car was ready for demonstration runs at the 2021 Goodwood Revival. The plan was always to race chassis IV, but this required some of the car’s original foibles

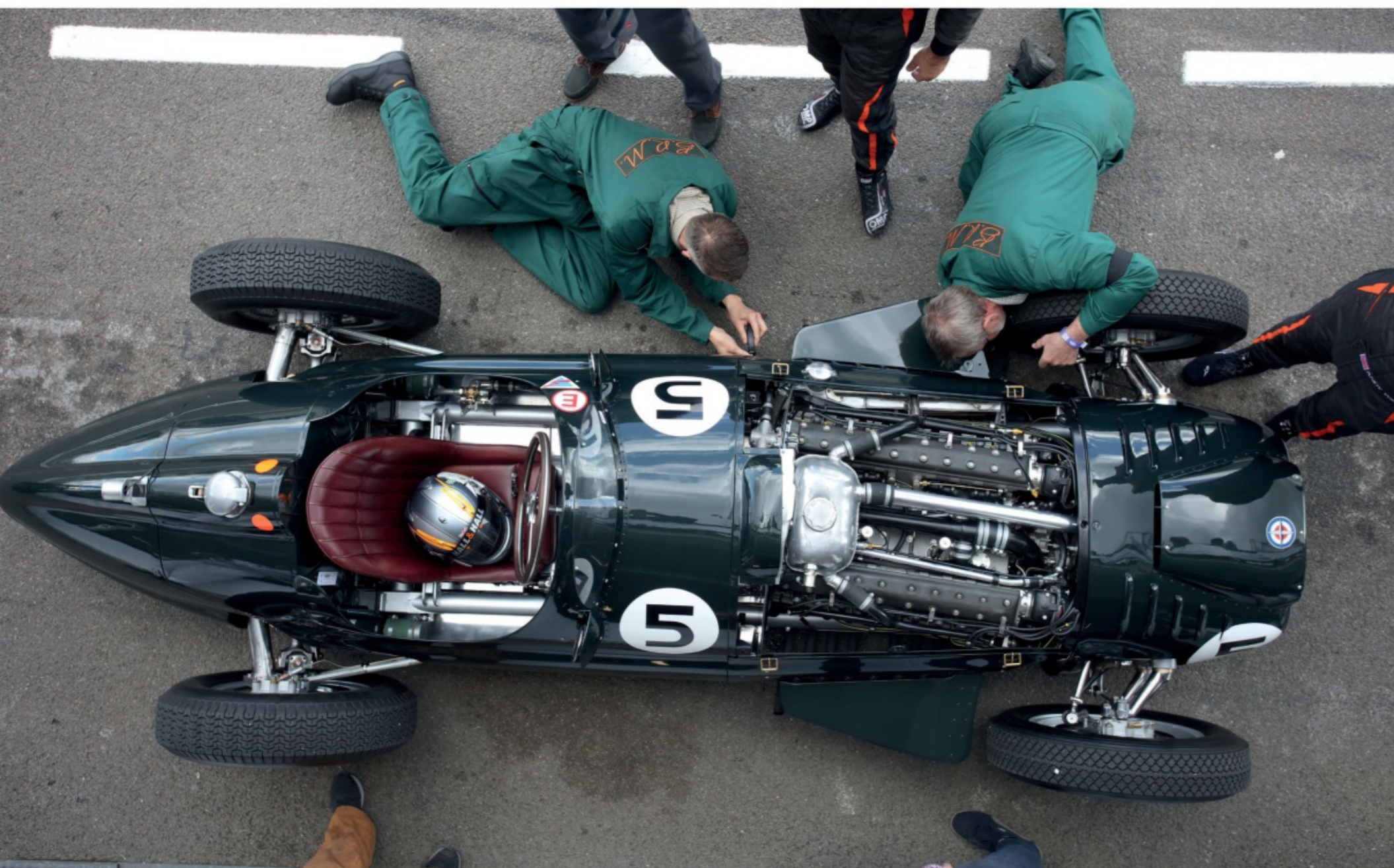
The ‘new’ V16 was raced for the first time in the 2022 Revival meeting. After practice problems, the car ran ninth before retiring

to be overcome – while resisting the temptation to use modern technology.

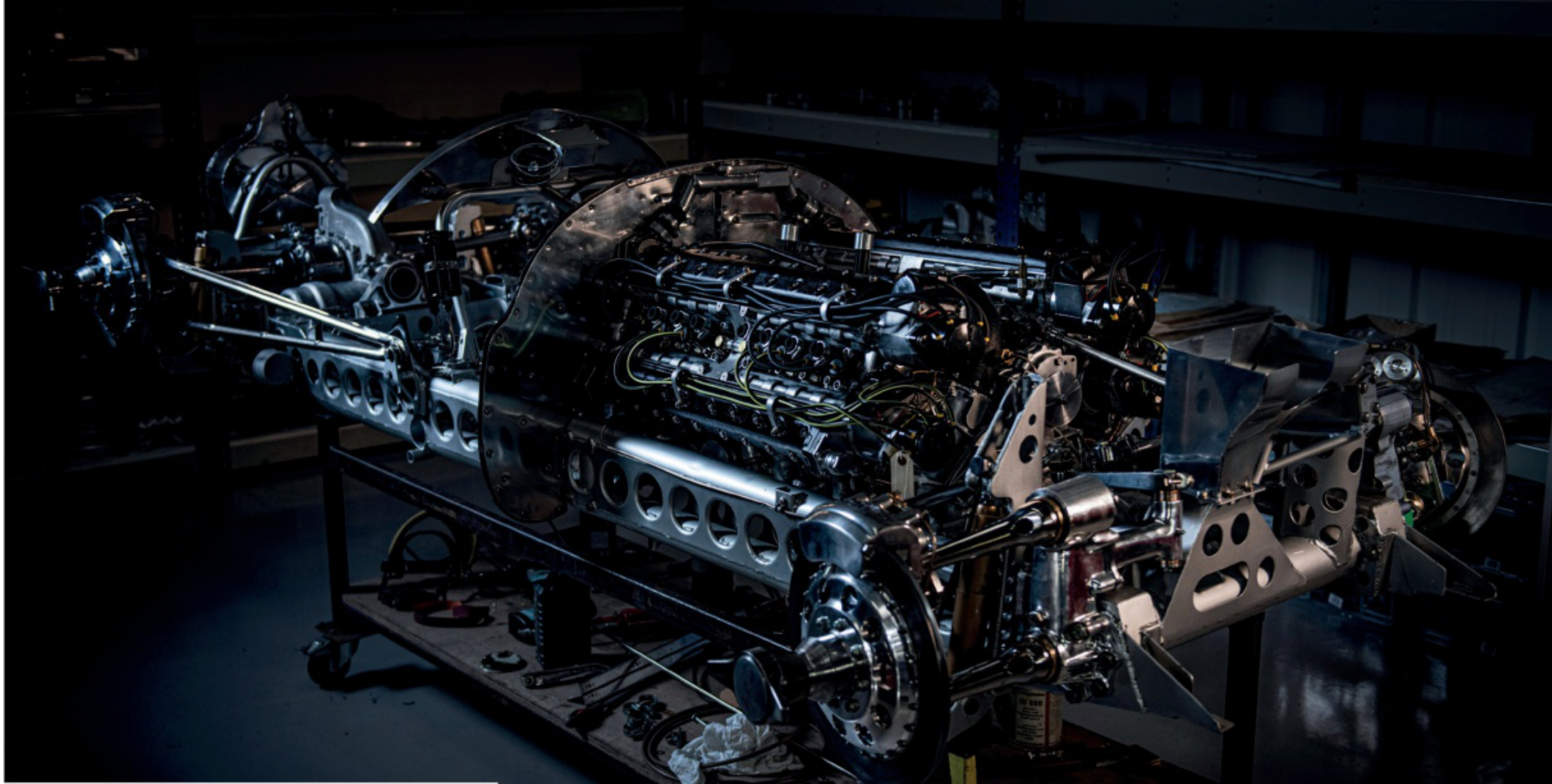
“A lot of the problems were to do with the magnetos,” explains Hall. “We’re still on the original bodies of the magnetos, but we’ve changed the armatures to a Magneti type, which were fitted in the Ferraris and Maseratis in period. We’ve also changed the coil – it looks the same but we’ve got more windings and we’ve changed some of the points and condensers.” An improved seal – though still using technology from the 1950s – also means the cylinder heads and block now fit together better.

And so to a sunny West Sussex for chassis IV’s debut at the 2022 Revival in the Goodwood Trophy for Grand Prix and Voiturette cars raced between 1930 and 1951, with experienced racer and son of Rick, Rob Hall, in the driving seat. While it was more auspicious than the original car’s debut, too much pressure in the fuel line caused a leak and limited the BRM to just four laps and 12th in practice, which set the grid. That fixed, Hall then ran ninth for much of the race before high oil temperatures forced him to pit.

It was a disappointing way for the weekend to finish, but the BRM – or rather, its sound – had



PICTURES: JAMES MANN; BRM



BUCKING THE PAST

You don't need to be a technical expert to spot the differences between the first BRM P15 that broke cover at Folkingham in December 1949 and the versions that won races in 1953-54. As well as the developments under the skin, the V16's bodywork changed extensively, largely to help with cooling.

That means chassis V – the next project on the Owen family and Hall & Hall's to-do list – will cause yet more interest when it's completed next year. The car, set to go to motorsport enthusiast Richard Mille, will reflect the earliest days of the BRM project by recreating the prototype V16.

Key to the idea was the discovery of the original handcrafted body buck. Another longtime motorsport figure Geoffrey Marsh called Rick Hall about its whereabouts: the roof of a boathouse belonging to its creator, George Gray.

"Finding the buck inspired the line of thinking for chassis V, otherwise it wouldn't really have been possible to do," says Paul Owen. "That really is a shape that hasn't been seen for more than 70 years, since the modifications were made. It pretty quickly started getting louvres and extra cooling."

The 1949-spec machine will have drum brakes, as opposed to the discs the car soon acquired. It's unlikely to be raced, but should add another element to the Owen family's aim of telling the BRM story. It doesn't stop there, though, since there will also be a chassis VI, built to a specification chosen by the buyer.

Understandably, the Owen family isn't keen on talking about the cost of the whole project, but Paul allows that it is a "significant investment". It's one all motorsport enthusiasts should be pleased they're making.

attracted a lot of attention and Hall Jr is confident his team understands the issues. "It didn't run 100% cleanly and we need a better oil cooler, but it's new-car blues" he says. "Running and racing are two different things and we're still learning."

"It handles great, the brakes are great and the engine is nearly there. You've got to applaud what the Owens have done and I think a lot of people enjoy what we're doing."

This is just the start. Further outings are planned, not to mention the building of two other chassis (see panel). "We've had various approaches from venues," says Paul Owen. "It does put bums on seats – it always did."

"It'll go out in anger once or twice a year. A V16 has never been to the States and it's not got to Europe much either – our plans going forward are pretty fluid, but we want to do things people find interesting."

Because the V16 didn't run cleanly at Goodwood, Rob Hall has yet to experience the V16 in raw, 'monster' mode, but he's not


"IT DIDN'T RUN 100% CLEANLY AND WE NEED A BETTER OIL COOLER, BUT IT'S NEW-CAR BLUES. RUNNING AND RACING ARE TWO DIFFERENT THINGS AND WE'RE STILL LEARNING"

ROB HALL



concerned. "It's not running as freely as it should, though you've still got to give it some respect," says Hall, who has experience in Can-Am cars and F1 racers of the 1980s on his CV. "We'll get there."

It could be argued the BRM P15 was too ambitious and too far ahead of its time to be a 1950s success – an engineering overreach, particularly given the financial and material limitations of its era. But now it's time for a new generation to show what it can do, albeit on a different and hopefully less-pressured stage.

Irrespective of how fast chassis IV ends up – could it once again take on the cars of the 1954-60 F1 period? – it's already started to achieve the goals of the BRM Reawakening project. "In terms of telling the story, introducing it to a new audience and going racing, we went racing with that sight and sound that hadn't been heard for 70-odd years," says Paul Owen. "We got a huge amount of positive feedback. People have been saying, 'We can't believe you've done it, it's fantastic.'" 

MAURICE HAMILTON'S

ALTERNATIVE VIEW

Outrage ensued when the Italian Grand Prix finished behind the Safety Car. But there was a time when simply getting races started was a challenge...

PICTURES  **motorsport
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SO, YOU SAY FIA OFFICIALS screwed up during the Italian Grand Prix? I tend to disagree. I don't recall seeing the starter come off his rostrum, stand on Charles Leclerc's front wheel in order to get a better view of the grid – and then start the race from this precarious post. Believe it or not, something along these lines actually happened 60 years ago this month.

To be fair, looking at today's FIA Sporting Regulations, there's no precise mention of where the starter should position himself. By my reckoning, there's more than 3,000 words covering everything a driver should do during the final countdown – almost from the moment he's been bothered by dumb TV reporter questions as he walks to the grid. You know the sort of thing: a breathlessly urgent enquiry about his strategy when starting 13th. I mean, what's he expected to say? "Yeah, well, obviously (a favourite F1 word) I'm hoping to have a gradual slide to the back of the field, get to the finish, obviously complain to my engineer about tyre deg, have a quick massage and then, obviously, off home to see Mum." Sorry – I'm obviously digressing.

There's no reference to the starter's location mainly because the drivers are focused on the lights and don't need to check out the movement of the person pushing the button. It wasn't always like that, of course. Back in the day, correctly reading the body language of the man with the flag could give you a head start. But if

anything got lost in translation, there could be confusion – as happened at Silverstone in 1971.

The prospect for pandemonium was established when Clay Regazzoni put his Ferrari on pole. 'Regga' was notorious for jumping the start from the second or third row, largely because he could get away with it thanks to the reluctance of officials to reprimand a naughty driver with a bandit moustache and grin. At the British GP that year, however, Regazzoni faced a quandary. Pole position – only the second of his career – would bring unaccustomed scrutiny. On the other hand, he had Jackie Stewart's Tyrrell alongside (precisely how Clay felt about Jackie would be revealed as they fought for second place on the final lap of the 1972 German GP, and Regazzoni unceremoniously shoved the Tyrrell into the barrier – Stewart has rarely, if ever, been so incandescent).

So, there we were at Silverstone, the cars rolling forward from a dummy grid that curved out of sight on the original profile of Woodcote corner. Regga, urgently blipping the throttle of his flat-12, saw Dean Delamont raise the Union Flag, let out the clutch – and then realised the RAC official had become unsure of himself and remained holding the flag in an upright position. Normally, Regazzoni would have been spearing his way towards Copse in a cloud of Firestone smoke. On this occasion, he hit the brakes.

Unfortunately, Clay's reputation had gone before him because several drivers were watching the Ferrari's rear wheels rather than Mr Delamont who, in any case, was partially hidden from the back rows because of the grid contour. Jackie Oliver, starting from the penultimate row, leapt forward then stopped, only to be hit from behind with such force that his McLaren was shoved into the back of Graham Hill's Brabham, breaking the BT34's rear suspension. Whereupon Delamont finally dropped the flag.

After wisely waiting for a few seconds, marshals leapt over the small retaining wall and dragged the stricken Brabham into the pitlane approach road. They managed this moments

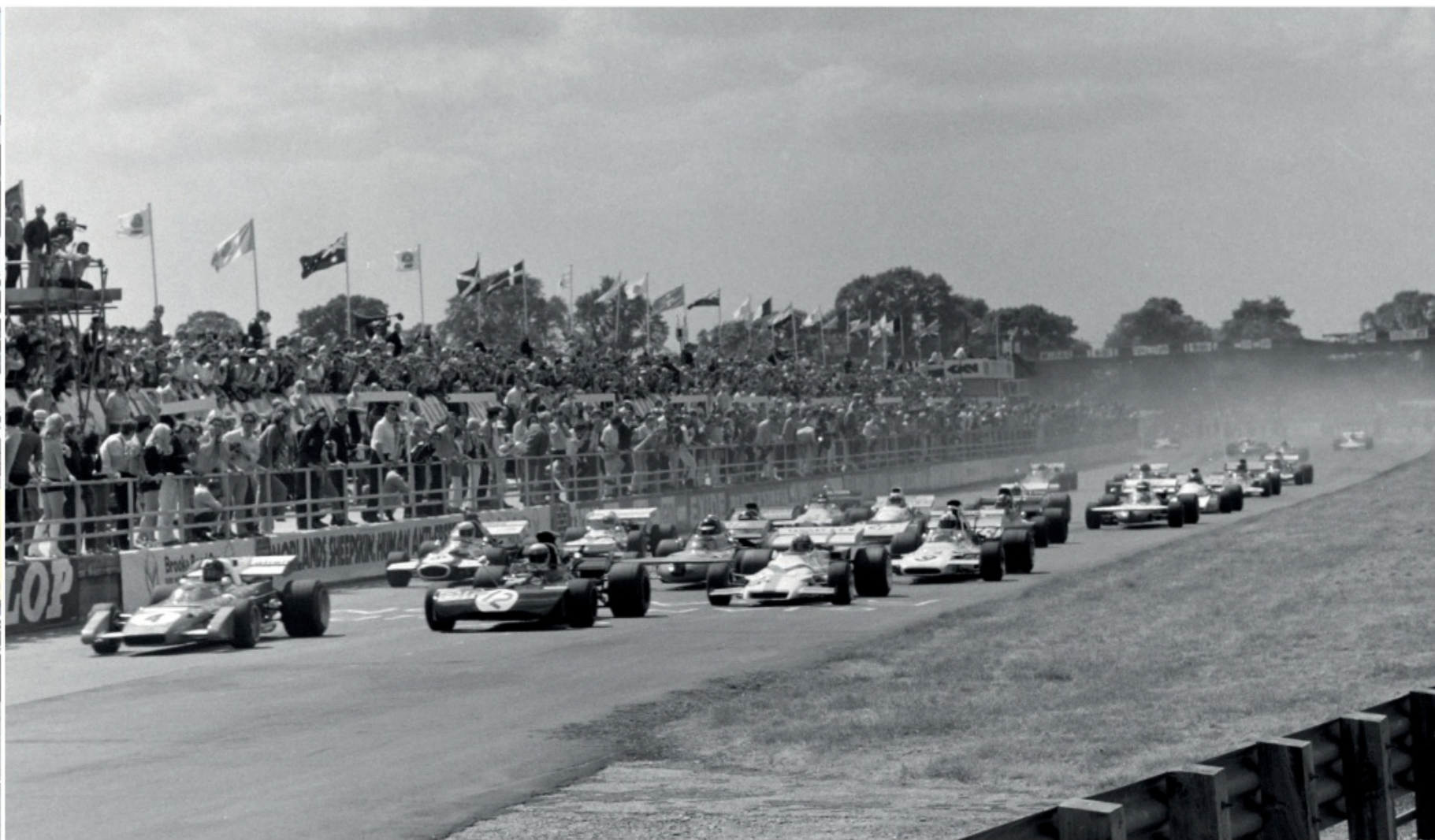


before the pack, led by Regazzoni, powered through Woodcote with its 150mph apex a whisker away from Hill's car. The drama wasn't yet over. Dave Charlton, struggling with a loose oil pipe on his Lotus 72, was steaming – in every sense – into the pits and got caught out by the parked Brabham. To avoid a big collision, Charlton had to urgently swing left – onto the racing line. Fortunately, no one was coming.

All the aforementioned, however, is kindergarten stuff compared with the bedlam 60 years ago in Mexico. Keen to create an impression in front of the Mexican president and the F1 world during the country's first (non-championship) GP in November 1962, the excitable officials somehow contrived to have three men on the grid, each of whom thought he should be starting the race.

A predictable lack of coordination became

THE EXCITABLE OFFICIALS SOMEHOW CONTRIVED TO HAVE THREE MEN ON THE GRID, EACH OF WHOM THOUGHT HE SHOULD BE STARTING THE RACE



The Italian GP ended under the Safety Car (above, left). Starting races safely used to be the issue – the 1971 British GP (above, right) was a classic example



The empty start/finish straight of the Magdalena Mixhuca circuit in 1963, a calm oasis compared with the chaos there a year earlier at the inaugural Mexican GP

evident when Jim Clark's pole-position Lotus stalled and no one seemed to know what to do. The Lotus mechanics had no doubts – they ran to the car and effectively caused the start to be delayed. Following a battery change the first push-start failed and, as the Lotus was rolled back, John Surtees' Lola began emitting smoke, suggesting something under the engine cover might be on fire. There was no question further back when Walt Hansgen's Lotus caught alight, accelerating official panic onto another level.

Mechanics with fire extinguishers were still on the grid when one official jumped onto the front wheel of Clark's (now running) Lotus and signalled the grid to get ready. A second man indicated 30 seconds to go – at which point the third official, who had the advantage of holding the flag, immediately dropped it... and the race was on. The first official fell from his Dunlop perch, bounced off the front of the Lotus and was narrowly missed by Roger Penske's Lotus, while Jack Brabham ran into official number two. As arguably seems right and proper, only the man with the Mexican flag remained unscathed.

In 60 years, they've got the hang of how to start races. It only remains for FIA to figure out how to finish them.

THE MEXICAN GRAND PRIX

It's now 60 years since Mexico hosted its first – non-championship – GP, before joining the official roster in 1963. After a chequered history the race is now a popular addition to the calendar

▼ *When F1 returned to Mexico in 2015, for the first time since 1992, it was at a revised Autódromo Hermanos Rodríguez. Nico Rosberg headed Lewis Hamilton in a comfortable Mercedes 1-2. Williams's Valtteri Bottas was third*





México



▲ Alain Prost's victory in 1990 meant he became the second man to win more than one Mexican GP, in only the 13th running of the race as a world championship event. The Ferrari driver, who won for McLaren in 1988, matched the feats of Jim Clark, winner in 1963 and 1967

► Nigel Mansell had already been crowned world champion when he won the 1992 Mexican GP, with Williams team-mate Riccardo Patrese second. Falling attendances, pollution and the deteriorating state of the track meant that this would be the last Mexican GP until 2015



▲ Like Mansell, Jim Clark was world champion in 1963 before the Mexican leg of the calendar. Clark didn't ease up in Mexico though. Smoking the wheels of his Lotus away from pole, Clark then lapped everyone apart from second and third, finishing 1m41s ahead of his nearest rival





In the 1989 race Alain Prost's gamble on softer race tyres than McLaren team-mate Ayrton Senna failed. To make matters worse, when Prost stopped for new rubber the team fitted him with the same compound of tyres again, forcing him into yet another visit to the pits. He rejoined just ahead of Senna on the track, but nearly a full lap down



The circuit held its final race under its original name of Magdalena Mixhuca in 1970, when the start was delayed by 75 minutes owing to fans encroaching on the track in a number of areas. It was removed from the 1971 calendar as a result. Mexico wouldn't host another world championship F1 race until 1986



In 1991 Ayrton Senna went off at the high-speed Peraltada corner during Friday practice, a repeat of an accident involving the Jordan of Bertrand Gachot earlier in the day. Senna, who in the lead up to the event had been injured in a jet-ski incident, hit the tyre barrier and rolled, but emerged unscathed. He qualified third the following day

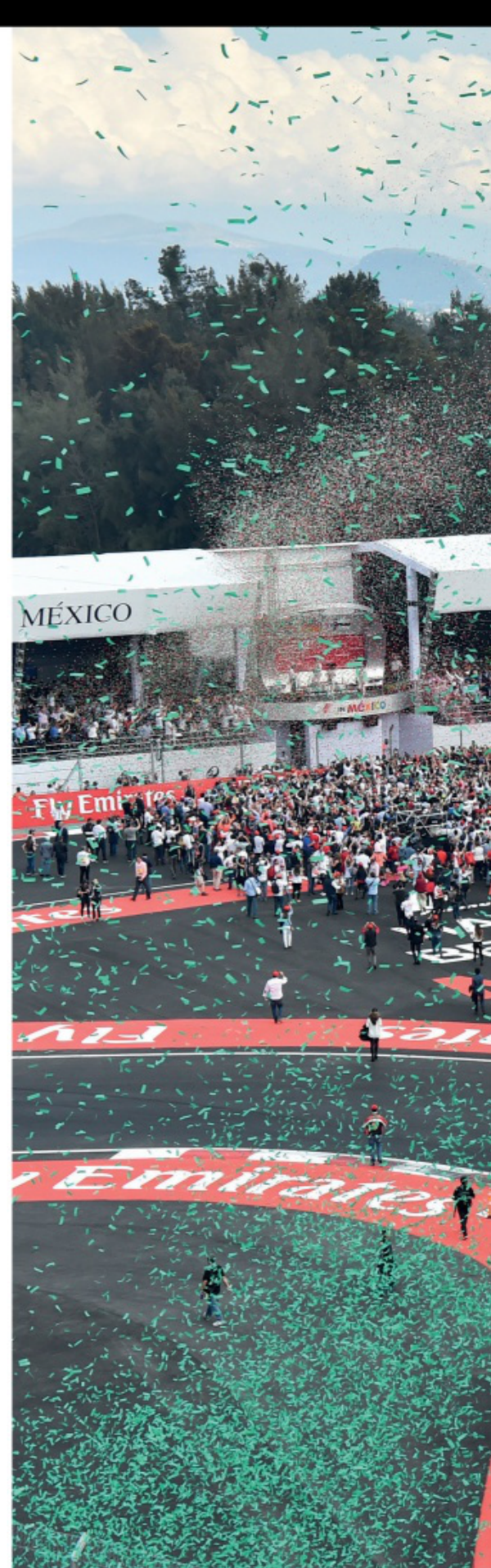




Until the emergence of Sergio Pérez, the most famous Mexican F1 drivers were brothers Ricardo and Pedro Rodríguez. Ricardo was killed in practice for the 1962 race while Pedro made his F1 debut the following year. After Pedro's death in a sportscar race in 1971, the Magdalena Mixhuca circuit was renamed in their honour

In 1992 Giovanni Amati signed for Brabham, the Italian attempting to become only the third woman to start a world championship F1 race. Unfortunately, the BT60B was no help to her and in Mexico, like in South Africa and Brazil, she was miles away from qualifying. Amati was replaced by Damon Hill after only three 'races'

Final qualifying for the 1988 race was dominated by this huge shunt for Frenchman Philippe Alliot, in his Larousse Lola LC88. Alliot lost control coming out of the banked Peraltada corner, hit the pitwall and barrel-rolled down the track. The car was repaired in time for the race, only for Alliot to retire on the opening lap





▲ When F1 once again blasted around Mexico City in 2015, the Autódromo Hermanos Rodríguez had undergone a number of Hermann Tilke-inspired changes, most notably regarding the Peraltada. With the Foro Sol baseball stadium built over part of it, this iconic corner was replaced by a series of slow turns through the stadium grounds

► Pre-qualifying, to whittle the entrants down to 30 cars for qualifying, was common in 1991 and was also needed in Mexico in 1992. Andrea Moda arrived with two Simtek-designed S921s for Alex Caffi and Enrico Bertaggia, but the cars couldn't be readied in time for pre-qualifying. By the Belgian GP the team had folded





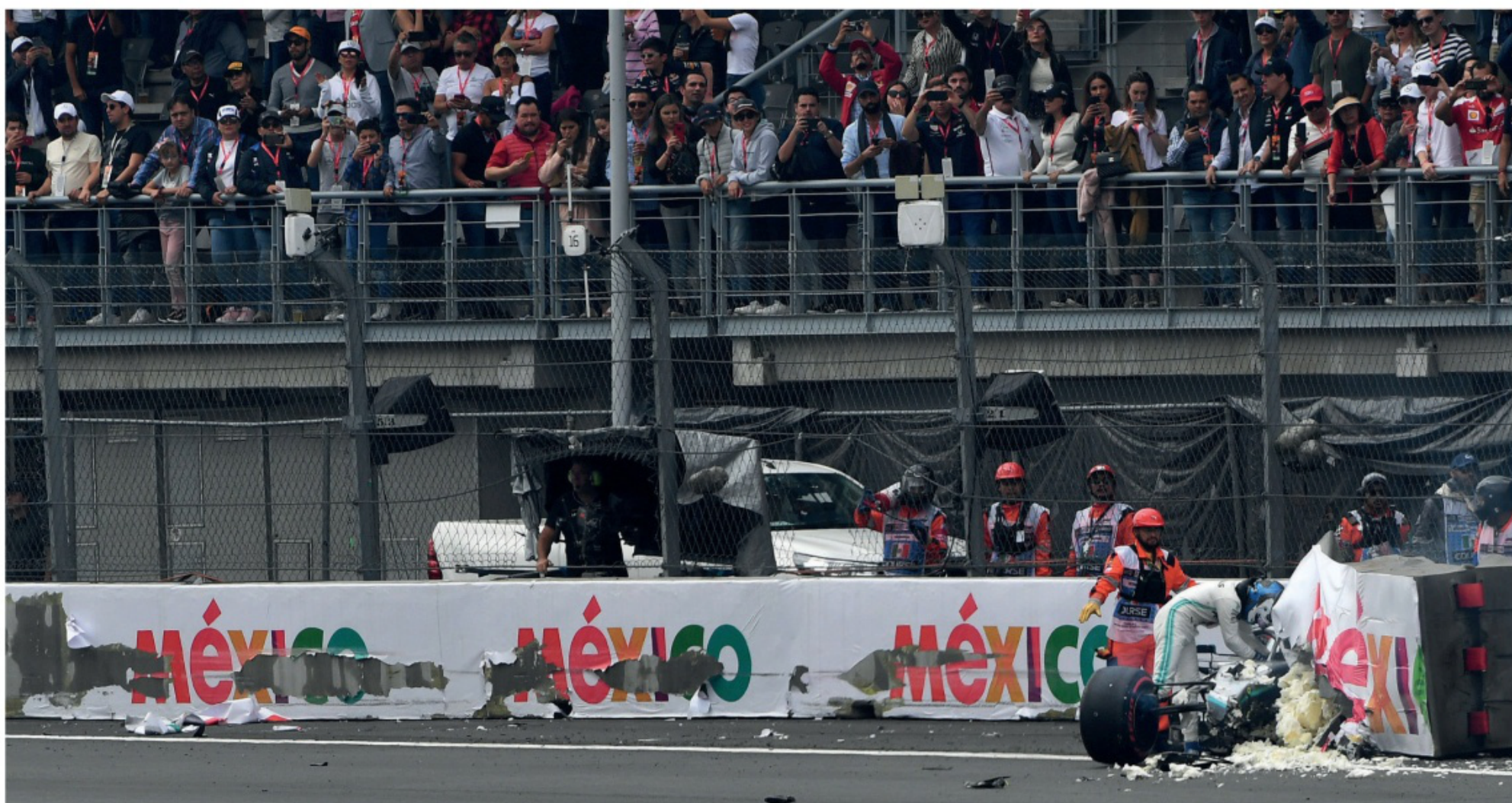
Honda engines have a good record at the Mexican GP, taking five wins in 21 races, two more than Ford and Mercedes. The first of these was in 1965 when the Japanese manufacturer also claimed its first (and to date only) win with a car and engine built in-house in Japan. The RA272 was driven to victory by Richie Ginther



In 2019 Valtteri Bottas ensured that the suppliers of trackside branding for the GP would have a bit of extra work on Saturday night, after this Q3 accident. Right at the end of the session Bottas, exiting the final corner, caught a kerb and then slid down the concrete wall, before hitting the end of a TecPro barrier



Thankfully, when Formula 1 did return to Mexico in 2015 there was at least one Mexican driver – Sergio Pérez – for the home crowd to cheer. A year earlier there had been two in race seats, but Esteban Gutiérrez had been relegated to a Ferrari test role by this stage. Pérez, driving for Force India, claimed four points for eighth





A puncture for Sebastian Vettel on the first lap of the 2015 race was the start of a bad day at the office for Ferrari. Vettel made it back to the pits and rejoined but team-mate Kimi Räikkönen went out on lap 22 after contact with Valtteri Bottas. Vettel then retired on his 51st lap after sliding off at the Esses



When F1 visited Mexico in 2021, after a break of a year due to the COVID-19 pandemic, the race had been renamed the Mexico City GP, and Sergio Pérez was a Red Bull driver in with a chance of a home victory. He could only manage third, but became the first Mexican to stand on a Mexican GP podium



By 2018 the drivers' championship had already been decided four times at the Mexican GP, in 1963, 1964, 1968 and 2017. Lewis Hamilton held a 70-point lead over Sebastian Vettel going into the 2018 race and, although Vettel finished second, fourth for Hamilton was enough to confirm his fifth title



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FINISHING STRAIGHT

RACE DEBRIEF

F1 WORLD CHAMPIONSHIP ROUND 17

THE SINGAPORE GP
IN 5 KEY MOMENTS

Victories in Baku, Monaco, and now Singapore mean Sergio Pérez can justifiably claim to be Formula 1's king of the streets

1 Resurgent Pérez takes another street-track win

It had been a cruel summer for Sergio Pérez. Through the efforts of the engineers, who have significantly 'lightweighted' the RB18, and Max Verstappen, who has already won eleven (by that point) races this season, Red Bull dashed Ferrari's title hopes. Pérez, however, struggled with the new balance of the car and was looking quite low-key in comparison with his team-mate. After winning in Monaco at the end of May, 'Checo' recorded just three podium appearances in nine races. Before the Singapore Grand Prix he seemed at best an outside contender for the victory.

Pérez rebuffed the naysayers by winning in

a pretty convincing way. It wasn't a dominating performance as such, but Pérez made the most of his opportunities – and, most importantly, on a weekend during which nearly everyone made costly mistakes, he was almost impeccably tidy.

Checo qualified on the front row thanks to Carlos Sainz making an error on his fastest lap and Red Bull miscalculating Verstappen's fuel allocation, which required Max to abort his final Q3 run. Sainz insisted after qualifying that he had the pole "all the way until [turn] 16", but then "had a moment there and lost it."

Checo was 0.022s behind Charles Leclerc's pole

time, but made up for it at the start. Leclerc had wheelspin, and Pérez claimed the lead into the first corner. Building a decent gap before the pitstops then enabled him to minimise the risk of Leclerc undercutting back into the lead – although this was rendered academic when Charles missed his braking point in the box, causing his stop to last over five seconds.

Pérez still had to fend off attacks from Leclerc when the Safety Car (caused by Yuki Tsunoda's accident) annulled the gap. But he didn't flinch – and the Ferrari driver never had much of a chance to overtake.



Lewis briefly battled with Max (left) but needed a front wing change (below) after an error. Verstappen (above) also had a tricky race...



Where Pérez did err was when preparing for the restart behind the Safety Car. On two separate occasions he drifted more than the permitted 10 car lengths behind the Mercedes piloted by Bernd Maylander, which was noted by the stewards. Yet they didn't issue him with a penalty immediately – instead announcing there would be additional examinations after the finish.

Pérez duly bailed himself out. Having heard from race engineer Hugh Bird that he might be facing a penalty, Checo quickly established a five-second gap, which came in very handy when the decision came down. While there was a chance he could be given two five-second penalties, one for each infringement, ultimately the punishment amounted to one reprimand and one five-second penalty.

Checo explained afterwards that the Safety Car had been travelling too fast in some parts of the track – and on the wet surface, an F1 car had insufficient traction to keep up. Yet the stewards stated in their decision that they “do not accept that the conditions were such as to make it impossible or dangerous” for Pérez to fall that far behind. On the other hand, they agreed to consider the conditions as “mitigatory circumstances”.

So Pérez kept his third victory with Red Bull, one that – after winning in Baku and Monaco – yet again came on a street track.

2 Unusually messy race for Verstappen and Hamilton

Max Verstappen came to Singapore with a mathematical chance of securing his second drivers' title, but the weekend proceeded in such a way that there were few reasons to juggle the different permutations as the chequered flag approached. Verstappen was the fastest driver in qualifying, but the team told him to abort two separate fast laps at the end of the session, stymied by an error in the calculations of the fuel level, which is always difficult to manage in changeable conditions.

On his final lap, Max was approaching the final sequence of corners well ahead of Leclerc's pole time, but was ordered into the pits. The team realised that if he finished the lap there wouldn't be enough fuel in the RB18's tanks for the FIA to take a sample – and Max would be excluded from qualifying. Instead, he ended up eighth on the grid.

A bad start in Sunday's slippery conditions complicated matters. Max had to thread his way past sundry midfielders who were keen to maintain track position at his expense, but it was Lando

Norris who made his race really difficult. Max ran out of patience and launched an overambitious attack after the transition to slick tyres. Norris stuck to the dry line for his braking, forcing Max to brake on a damp patch.

“I defended my position well, I put him into the wet patch,” Lando said after the race. “He locked up, so it was a win-win for me.”

Not only did Max miss the corner, he also flat-spotted his tyres, forcing him to make a second pitstop almost immediately after his first. All Verstappen could achieve after that was an eventual seventh.

The race was no less problematic for Max's big 2021 rival Lewis Hamilton, who also made uncharacteristic mistakes. Losing a position at the start, Lewis got stuck behind Sainz and, pushing to line up a move on the Ferrari, sent his Mercedes into the wall on lap 33. Hamilton was able to continue, but required a front-wing change.

At the end of the race Lewis made another mistake, this time defending eighth position from Verstappen. Max would have probably been able to pass Hamilton without the extra help, but Lewis again missed his braking point and let the Red Bull ahead. Ninth place was the logical outcome of what was a mediocre race for the seven-time world champion. ▶



RACE DEBRIEF

F1 WORLD CHAMPIONSHIP ROUND 17

3 Alpine leaves open goal for McLaren

For a second consecutive weekend Alpine failed to score. Both its drivers retired owing to reliability issues and, to make things worse, key rival McLaren had its best race result of the year.

Fernando Alonso was once again one of the heroes of qualifying. As in Canada he was putting in purple sectors throughout the session on the damp track, but this time he finished the session fifth. He lost out to Lando Norris at the start but a points-

paying finish was almost guaranteed, so long as the team didn't commit any strategic blunders. And as long as the power unit held out, which it only managed for 20 laps (of the scheduled 61).

His team-mate's weekend turned out no better. Esteban Ocon dropped out of qualifying in Q1 because of a braking problem, and also retired from the race because of engine woes. The power unit on his car lasted only six laps longer than Alonso's.



The battle for fourth swung again as Norris (above) and Ricciardo took full advantage of engine issues for Ocon (below) and Alonso



Alpine sees this a consequence of its risky engine development strategy, which prioritised performance. "Obviously we took a lot on this year, changing a huge amount," explained the team's chief technical officer Pat Fry. "And we're a huge amount better off in terms of performance for what has been done over the last couple of years, really. Some great work has gone on, but it was always done knowing that we'd chase performance – and reliability we'll fix."

McLaren took full advantage of its direct competitor's failures. Lando Norris pointed out after the finish that the MCL36 wasn't competitive on either a dry or a fully wet track, but somehow came alive on something in between. Lando earned a place on the third row of the grid on Saturday on a drying track, and on Sunday ran a mistake-free race, taking advantage of the generosity of Verstappen and Hamilton to finish fourth.

As has become habitual, Daniel Ricciardo didn't reach Q3, but was the main beneficiary of the crossover from intermediate tyres to slicks. McLaren made its pitstops at the perfect moment, thanks to which Ricciardo gained track position and as a result finished right behind his team-mate – in terms of placings (fourth and fifth) at least, rather than the gap (32 seconds).

In any case, it was the first time McLaren scored over 20 points in a race this season, and it overtook Alpine in the constructors' standings.

4 Aston Martin reaches 2022 highlight

The green team enjoyed its best weekend of the year in Singapore. If at the beginning of the season it seemed that the only real rival for Aston Martin would be Williams, the situation has changed as the campaign progressed. The updates – including those which temporarily earned the AMR22 its nickname of "the green Red Bull" – have seriously raised expectations.

Saturday didn't go too smoothly for Lance Stroll and Sebastian Vettel. The team decided to take a risk in Q2, sending them both out on slicks. As a result, neither made it to the final segment. In the race the team would make only the right decisions.

Vettel got a great start, gaining five positions and immediately breaking into the top 10 from his 13th position on the grid. Stroll got ahead of Kevin Magnussen on lap one and later took advantage

PICTURES: ZAK MAUGER; SIMON GALLOWAY



of an error from Yuki Tsunoda. He then picked up several more positions thanks to a timely pitstop, and made it up to sixth place.

That put Lance ahead of his team-mate – who, at the end of the race, found himself defending from Hamilton and then Verstappen. Max was eventually able to break Seb’s resistance on the final lap. “I knew I needed a very good exit out of [turn] five,” Vettel said after the finish. “I was very quick on the way in, but had a little wobble on the way out, and Max obviously had a clean run.”

Either way, Aston had both cars finish in points-scoring positions for only the second time this season, and Stroll secured his first finish above 10th. This allowed his father’s team to surpass both AlphaTauri and Haas in the constructors’ standings.

5 Gasly says team ‘threw away’ result

Pierre Gasly finished the race in the top 10, but was very unhappy. “Today we didn’t do a good job,” he fumed. “We had everything in our hands and we threw it away.”

He had a point. AlphaTauri got lucky with the weather in Singapore. The AT03 looked miserable

Stroll and Vettel pushed Aston up to seventh in the points with their efforts in Singapore

in Friday’s practice sessions on the dry track, but both drivers made it into Q3 on Saturday’s wet track. Gasly earned himself the seventh spot for the start and was in a position to score points, since track conditions were similar on Sunday.

Pierre kept the position at the start, holding off both Aston Martin drivers and Daniel Ricciardo, but the team rushed him to the pits for slicks as the track was drying. Others decided to wait longer, and Gasly lost three positions as a result.

“There was no communication, no dialogue, and we took a gamble in a moment where we didn’t need to,” Gasly said. “In the position we were in, you’re ahead of your two main rivals, you have track position in Singapore, it’s drying conditions, you know, the [tyre] warm-up is going to be tricky... I don’t see the point of risking it like that.”

One point earned by Pierre for finishing in 10th wasn’t enough for AlphaTauri to hold on to eighth in the constructors’ championship. The Singapore round left the team ahead of only Williams.

Gasly was unhurt after this FP2 fire, but was angry with the team’s strategy on race day



RESULTS ROUND 17

MARINA BAY / 02.10.22 / 59 LAPS



1st	Sergio Pérez Red Bull	2h02m20.238s*
2nd	Charles Leclerc Ferrari	+2.595s
3rd	Carlos Sainz Ferrari	+10.305s
4th	Lando Norris McLaren	+21.133s
5th	Daniel Ricciardo McLaren	+53.282s
6th	Lance Stroll Aston Martin	+56.330s
7th	Max Verstappen Red Bull	+58.825s
8th	Sebastian Vettel Aston Martin	+60.032s
9th	Lewis Hamilton Mercedes	+61.515s
10th	Pierre Gasly AlphaTauri	+69.576s
11th	Valtteri Bottas Alfa Romeo	+88.844s
12th	Kevin Magnussen Haas	+92.610s
13th	Mick Schumacher Haas	+1 lap
14th	George Russell Mercedes	+2 laps

*includes 5s penalty for Safety Car infringement

Retirements

Yuki Tsunoda AlphaTauri	34 laps - accident
Esteban Ocon Alpine	26 laps - engine
Alex Albon Williams	25 laps - accident
Fernando Alonso Alpine	20 laps - engine
Nicholas Latifi Williams	7 laps - damage
Zhou Guanyu Alfa Romeo	6 laps - collision

Fastest lap

George Russell 1m46.458s on lap 54

TYRE COMPOUNDS USED



CLIMATE

Damp/
night

AIR TEMP

26°C

TRACK TEMP

28°C

DRIVERS’ STANDINGS

1 Verstappen 341pts	12 Vettel 24pts
2 Leclerc 237pts	13 Gasly 23pts
3 Pérez 235pts	14 Magnussen 22pts
4 Russell 203pts	15 Stroll 13pts
5 Sainz 202pts	16 Schumacher 12pts
6 Hamilton 170pts	17 Tsunoda 11pts
7 Norris 100pts	18 Guanyu 6pts
8 Ocon 66pts	19 Albon 4pts
9 Alonso 59pts	20 De Vries 2pts
10 Bottas 46pts	21 Latifi 0pts
11 Ricciardo 29pts	22 Hülkenberg 0pts





FINISHING STRAIGHT

RACE DEBRIEF

F1 WORLD CHAMPIONSHIP ROUND 18

THE JAPANESE GP IN 5 KEY MOMENTS

1 Confusion reigns as well as Max in truncated race

Max Verstappen claimed his second world championship in a peculiarly anticlimactic fashion despite winning the rain-delayed and shortened Japanese Grand Prix by a commanding margin. Revisions to the sporting regulations in the wake of last year's farcical non-race in Belgium had a crucial bearing on how many points could be awarded, but the majority of the teams failed to pick this up – Verstappen himself believed he had fallen short.

The final moments of the race and its aftermath therefore played out in utter confusion as first there was uncertainty over whether the race was actually over once the chequered flag had been waved, then disbelief when Max was informed he

was the world champion – mid-way through the parc fermé interviews. Central to the ambiguity was the hiatus of over two hours between the initial red flag and the restart, leaving just 40 minutes before the mandatory three-hour cut-off. Not enough to complete the 75% race distance many teams thought was the threshold for full points.

Having secured pole in dry conditions by 0.01s from Leclerc, Max made heavy weather of his getaway in the wet on Sunday, taking off in second gear rather than first to avoid incurring wheelspin. That enabled Charles to get his nose ahead before Verstappen swept around the outside to reclaim the lead into the first corner. But only this first



Verstappen celebrates the race win and, by this stage, was also aware that victory had been enough to claim his second world title

PICTURES: STEVEN TEE; ZAK MAUGER



Sainz's car is eventually removed during the stoppage, but a tractor on track at the same time as the cars brought back horrible memories

lap would be completed under racing conditions as fourth-placed Carlos Sainz aquaplaned under acceleration after the hairpin, smote a barrier and rotated back onto the circuit. The Safety Car was deployed but the red flag swiftly followed.

127 minutes passed before the rain abated sufficiently for the FIA to resume the race via a rolling start with the entire field on 'extreme' wet tyres. But it was clearly approaching a point where intermediates would be the better choice, and that threshold was illustrated by the performance of tail-enders Sebastian Vettel and Nicholas Latifi, who pitted almost immediately.

The leaders promptly followed suit and Verstappen pulled away from Leclerc at a second or more per lap thereafter. Still operating in the belief that full points wouldn't be awarded, Red Bull thought Max would be a point short of winning the title unless he took the fastest lap. But Leclerc was still too close for Max to pit for fresh tyres – until he straightlined the chicane under pressure from Pérez on what turned out to be the final lap. Checo would be awarded second place retrospectively when Leclerc was handed a five-second penalty.

When a regular race hits its two-hour limit, it is flagged on the lap after that threshold has passed. The rule is different for when a suspended race hits the three-hour mark – then the chequered flag is displayed immediately. Thus Max's engineer told him to carry on in case there had been an error – he was nearly at the end of what should have been his cool-down lap before team principal Christian Horner radioed him that he'd won the grand prix.

But still no title celebrations. Max had already concluded his first parc fermé interview when the FIA's media delegate told him he was the new world champion. The revised wording in the rulebook states that reduced points are only awarded if a race is suspended and *cannot be resumed*.

"I had no clue what they were going to decide with the points," said Max. "Once I crossed the line, I was like, 'OK, that was an amazing race. Good points again. But not world champion yet.' I did my interview after the race. And then my mechanics started to cheer, and I was like, 'What's going on?'"

2 Tractor incident ignites safety concerns

Glum weather on race day at Suzuka always brings back memories of that tragic day in 2014 when Jules Bianchi had the accident which cost him his life. It is, therefore, hardly surprising that the inexplicable presence of a recovery vehicle on track before the 2022 race was red-flagged should provoke such a powerfully emotive response.

Carlos Sainz's first-lap accident also removed a section of advertising hoarding which Lewis Hamilton and several other drivers missed only narrowly in the dreadful visibility before the passage of cars pulled the banner further onto the track. There it was struck head-on by Pierre Gasly, who had started from the pitlane.

Gasly pitted under Safety Car conditions but was pushing to catch up the pack – at around 155mph – when he encountered the recovery vehicle, which had been dispatched to collect Sainz's stranded Ferrari. The stewards handed him a time penalty as well as two penalty points on his licence.

Without doubt the optics of appearing to blame Gasly for the incident were poor. Afterwards the grid was united in condemnation of the presence of a recovery vehicle on track while the race was in progress, even under Safety Car conditions.

"We spoke a little bit about it in the drivers' briefing this week," said George Russell, a director of the Grand Prix Drivers' Association. "Because there was a tractor on track in Singapore with [Yuki] Tsunoda's crash under a Safety Car, and it was at the point where people were transitioning to slicks. And we expressed our view that we don't ever want to see that happen.

"That was obviously last week. To come here one week later, given the circumstances and the history, is pretty disappointing."

"While it is normal practice to recover cars under Safety Car and red flag conditions," said the FIA in a statement, "due to the particular circumstances and also taking into account feedback from a number of drivers, the FIA has launched a thorough review of the events involving the deployment of recovery vehicles during the Japanese Grand Prix. This is part of the common practice of debrief and analysis of all race incidents to ensure continual improvements of processes and procedures." ▶



FINISHING STRAIGHT

RACE DEBRIEF

F1 WORLD CHAMPIONSHIP ROUND 18

Despite having Hamilton on his tail for most of the race, Ocon's racecraft and the Alpine's straightline speed won out in the end



3 Alpine pulls off Mercedes coup

The Sunday before travelling to Suzuka, a disconsolate Esteban Ocon had taken a Singapore MRT train back to the pits, still clad in his full race gear after an engine failure marooned him on the far side of the track. If this was a low point of his season, Japan rewarded the Alpine driver with his most impressive outing since that unexpected victory in Hungary last year.

Ocon outqualified both his team-mate, Fernando Alonso, and the two Mercedes drivers to start fifth, ahead of Lewis Hamilton in sixth, Alonso in seventh and George Russell in eighth. He held that position from the race start while Alonso briefly passed Hamilton into the hairpin on the opening lap before the Merc's superior traction – assisted by running higher downforce levels – told at the exit.

Alonso exits his pit box on a new set of intermediate tyres, with less than 10 minutes of the shortened race remaining



Having gained a position via Sainz's crash, Ocon took the restart in fourth and held on to it despite sustained pressure from Hamilton throughout the remainder of the race. Time and again Lewis closed in, only to be frustrated by Ocon's neat track positioning and the Alpine's speed in a straight line. Here the W13's high downforce setup combined with the absence of DRS (never activated in the wet conditions) to frustrate any attempts to get by on the straight.

Alonso's route to seventh was a little more eventful. He stopped for intermediates at the end of lap 7, one later than most of the field, but dived in for a new inters on lap 22, with just eight minutes of the race remaining. That cost him just two places and he quickly made them up, passing Nicholas Latifi and Russell, and coming close to passing Sebastian Vettel on the final lap before crossing the line almost alongside. Vettel described the move, at the chicane, as "a bit aggressive".

For Russell it was a long road back into the points after losing seven places when Mercedes brought him and Hamilton in for intermediates on the same lap, and he was briefly held up before his team-mate exited the box. "The worst decision we ever made," he fulminated afterwards.

4 Vettel nails unlikely points finish

Sebastian Vettel is something of a stranger to Q3 these days but usually shows well at Suzuka. Still, a casual observer would have been hard-pressed to tip Vettel for a points finish after he squandered his ninth-place start by spinning on the opening lap. Vettel sprang from the line much faster than Alonso ahead, but in going between the Alpine and the grass Seb encountered deep puddles which set the Aston Martin twitching. As Vettel turned in to the first corner he touched wheels with the Alpine and spun off.

The smart money would then have been on team-mate Lance Stroll, who had started 18th but then pulled off one of his consummate opening laps, diving through a minimal gap between both Alfa Romeos and the pitwall and gaining seven places.

Vettel turned his race around by making an audaciously early call for intermediates following the restart, though he had little to lose since he was running 16th out of 18 at the time. A rather dicey release got him out ahead of Nicholas Latifi, who pitted at the same point, and as others did likewise

PICTURES: ANDY HONE; ZAK MAUGER; FIA



over the following five laps Vettel's early mover advantage elevated him to sixth place.

"We spoke about it [pitting early] before," said Vettel. "The team worked something out. And I made the call judging the conditions, but it worked really well."

"We dragged the car up to where it probably doesn't belong. Even splitting the Alpines, which are a lot faster than us. We managed to hang in there, so I really enjoyed the weekend. And I love everything about this place."

Stroll finished out of the points in 12th after a second stop for intermediates cost him four places, only three of which he managed to regain before the chequered flag.

5 Latifi holds on for first points of 2022

As Nicholas Latifi eyes the end of his Formula 1 career he can place this performance at Suzuka, one of the great drivers' circuits and one which is even more challenging in the wet, in his highlights reel. That didn't look the case after qualifying on Saturday, where he was two tenths off team-mate

After his first-lap spin (above), points looked unlikely for Vettel but he held off Alonso (top) for sixth after his early stop for intermediates

Alex Albon and last on the grid.

Albon was an early casualty on race day, when an opening-lap clash with Kevin Magnussen punched a hole in his radiator which caused his engine to malfunction. That left Latifi to uphold the team's honour.

When GP Racing spoke to Jost Capito ahead of the Japanese Grand Prix (see p50), the Williams team principal lamented the absence of circumstances in which his outfit could take some tactical risks and try to squeeze some benefit from uncertain weather. The diminishing intensity of the rain before the restart at Suzuka enabled Williams to gamble on an early stop for intermediates and Latifi duly shook out in eighth place, losing just one spot (to Russell) as the race progressed.

"Nicky did an excellent job in tricky conditions," said Williams' head of vehicle performance, Dave Robson. "He was part of the decision to make the early switch to inters and this paid handsomely."

Latifi turned a poor qualifying (below) into ninth, the early gamble for inters paying off



RESULTS ROUND 18

SUZUKA / 09.10.22 / 28 LAPS



1st	Max Verstappen	Red Bull	3h01m44.004s
2nd	Sergio Pérez	Red Bull	+27.066s
3rd	Charles Leclerc	Ferrari	+31.763s*
4th	Esteban Ocon	Alpine	+39.685s
5th	Lewis Hamilton	Mercedes	+40.326s
6th	Sebastian Vettel	Aston Martin	+46.385s
7th	Fernando Alonso	Alpine	+46.369s
8th	George Russell	Mercedes	+47.661s
9th	Nicholas Latifi	Williams	+70.143s
10th	Lando Norris	McLaren	+70.782s
11th	Daniel Ricciardo	McLaren	+72.877s
12th	Lance Stroll	Aston Martin	+73.904s
13th	Yuki Tsunoda	AlphaTauri	+75.599s
14th	Kevin Magnussen	Haas	+86.016s
15th	Valtteri Bottas	Alfa Romeo	+86.496s
16th	Zhou Guanyu	Alfa Romeo	+87.043s
17th	Mick Schumacher	Haas	+92.523s
18th	Pierre Gasly	AlphaTauri	+108.091s**

*includes 5s penalty for leaving the track and gaining an advantage
**includes drive through penalty converted to 20s time penalty for speeding under red flag conditions

Retirements

Carlos Sainz	Ferrari	0 laps - spin
Alex Albon	Williams	0 laps - accident

Fastest lap

Zhou Guanyu 1m44.411s on lap 20

TYRE COMPOUNDS USED



CLIMATE



AIR TEMP

16°C

TRACK TEMP

88°C

DRIVERS' STANDINGS

1 Verstappen	366pts	12 Ricciardo	29pts
2 Pérez	253pts	13 Gasly	23pts
3 Leclerc	252pts	14 Magnussen	22pts
4 Russell	207pts	15 Stroll	13pts
5 Sainz	202pts	16 Schumacher	12pts
6 Hamilton	180pts	17 Tsunoda	11pts
7 Norris	101pts	18 Guanyu	6pts
8 Ocon	78pts	19 Albon	4pts
9 Alonso	65pts	20 Latifi	2pts
10 Bottas	46pts	21 De Vries	2pts
11 Vettel	32pts	22 Hülkenberg	0pts





FINISHING STRAIGHT

RACE PREVIEW

F1 WORLD CHAMPIONSHIP ROUND 19

UNITED STATES GP

21-23 October 2022
Circuit of The Americas

PICTURE: ANDY HONE. ILLUSTRATION: ALAN ELDRIIDGE



RACE DATA

Venue Circuit of The Americas**First GP** 2012**Number of laps** 56**Circuit length** 3.425 miles**Race distance** 191.633 miles**Lap record** 1m36.169s

Charles Leclerc (2019)

F1 races held 9**Winners from pole** 5**Pirelli compounds** C2, C3, C4

CAR PERFORMANCE

Downforce level Medium**Cooling requirement** Medium**Full throttle** 63%**Top speed** 205mph**Average speed** 121mph

TIMETABLE (UK TIME)

Friday 21 October**Practice 1** 20:00-21:00**Practice 2** 23:00-00:00**Saturday** 22 October**Practice 3** 20:00-21:00**Qualifying** 23:00-00:00**Sunday** 23 October**Race** 20:00**Live coverage** Sky Sports F1**Highlights** Channel 4

THE MAIN EVENT

Formula 1 regained a foothold in the United States with this ambitious new-build circuit near the Texas state capital, Austin. As the commercial rights holder builds towards running a third annual event on US soil next year when Las Vegas joins Miami and Austin, it's easy to forget what a risky undertaking this was before *Drive to Survive* added rocket fuel to F1's growth on this side of the pond. From its opening in 2012 the venue has struggled to make ends meet financially, and it has had to weather storms both literally (it flooded after a freak deluge in 2015) and figuratively (losing out on a state subsidy in 2018 then being unable to host the 2020 race owing to the pandemic).

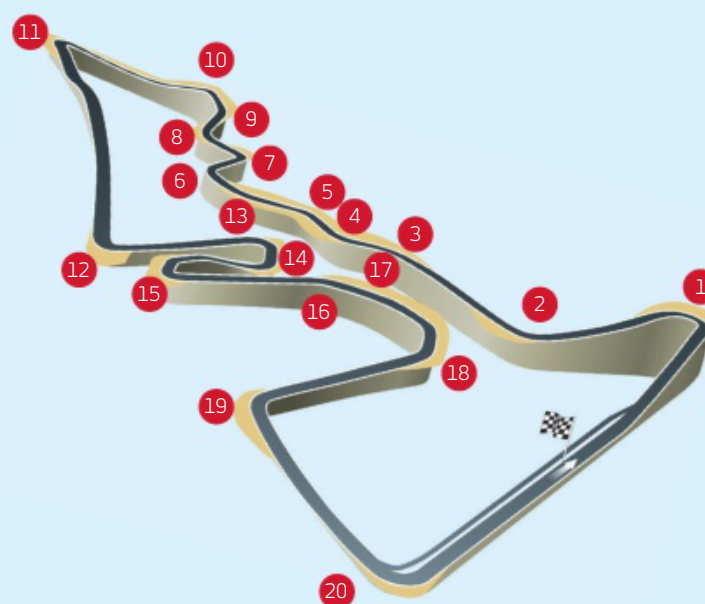
Nevertheless this is one of the most popular venues on the F1 calendar thanks to the challenge of the track and its proximity to the vibrant city of Austin.

2021 RACE RECAP

Max Verstappen extended his lead over Lewis Hamilton in the drivers' championship with a win from pole position – but this was no lights-to-flag victory. Hamilton snatched the lead at the start and Verstappen only regained it by undercutting Lewis with an aggressively early first pitstop. Max retained the lead after the second round of stops but Hamilton had managed to stretch his second set of tyres out for longer, entering the final stint behind on track but with a generous tyre offset.

Nevertheless Verstappen managed to hold on, drafting past the lapped Mick Schumacher on the final tour to deny his rival an opportunity to pass.

KEY CORNER: TURN 1 On a track that was built to incorporate some of the best corners from F1's classic tracks, Turn 1 was inspired by the old Österreichring. This sharp corner at the top of a slope has a blind entry and is one of the key overtaking points on the lap.



THE PAST FIVE WINNERS HERE



2021

Max
Verstappen
Red Bull

2019

Valtteri
Bottas
Mercedes

2018

Kimi
Räikkönen
Ferrari

2017

Lewis
Hamilton
Mercedes

2016

Lewis
Hamilton
Mercedes

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FINISHING STRAIGHT

RACE PREVIEW

F1 WORLD CHAMPIONSHIP ROUND 20

MEXICO CITY GP

28-30 October 2022

Autódromo Hermanos Rodríguez



PICTURE: STEVEN TEE. ILLUSTRATION: ALAN ELDREDGE



RACE DATA

Venue Autódromo Hermanos Rodríguez**First GP** 1963**Number of laps** 71**Circuit length** 2.674 miles**Race distance** 189.88 miles**Lap record** 1m17.774s

Valtteri Bottas (2021)

F1 races held 21**Winners from pole** 9**Pirelli compounds** C2, C3, C4

CAR PERFORMANCE

Downforce level High**Cooling requirement** High**Full throttle** 47%**Top speed** 227mph**Average speed** 115mph

TIMETABLE (UK TIME)

Friday 28 October**Practice 1** 19:00-20:00**Practice 2** 22:00-23:00**Saturday** 29 October**Practice 3** 18:00-19:00**Qualifying** 21:00-22:00**Sunday** 30 October**Race** 20:00**Live coverage** Sky Sports F1**Highlights** Channel 4

THE MAIN EVENT

It's rare for modern racetracks to be completely faithful to their original outlines, since growing car performance and improved safety requirements – and, in some cases, nearby property developments – have dictated changes down the years. But Mexico City's circuit still follows most of the original lines laid down in 1959 when it was built in what was the Magdalena Mixhuca Sports Park. Given that it lies in the heart of one of the most sprawling cities on Earth, there hasn't been much room for expansion or adaptation.

That's why its signature corner, the fast 180-degree Peralta, had to go – the run-off area was dangerously short even in the 1980s, and there's a multi-lane road on the other side of the fence so it couldn't be extended. The track now winds through a baseball stadium at the site, which is atmospheric if not conducive to overtaking.

2021 RACE RECAP

Valtteri Bottas started on pole for Mercedes but got off the line poorly and was nerfed to the back of the field at Turn 1 by McLaren's Daniel Ricciardo. A familiar narrative then developed as the race became a battle between championship protagonists Max Verstappen and Lewis Hamilton, although Max's team-mate Sergio Pérez gave his home crowd cause for celebration by briefly taking the lead during the pitstop phase.

Red Bull had the edge over Mercedes in the thin air of Mexico City and Verstappen stretched away to win by over 16s as Hamilton fought to stay ahead of Pérez.

KEY CORNER: TURN 4 A 90-degree left-hander at the end of a short straight, this section is a potential pinch point for opportunist moves between drivers who have had a disrupted passage through the opening sequence of bends.



THE PAST FIVE WINNERS HERE



2021

Max
Verstappen
Red Bull

2019

Lewis
Hamilton
Mercedes

2018

Max
Verstappen
Red Bull

2017

Max
Verstappen
Red Bull

2016

Lewis
Hamilton
Mercedes



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FINISHING STRAIGHT

RACE PREVIEW

F1 WORLD CHAMPIONSHIP ROUND 21

SÃO PAULO GP

11-13 November 2022
Autódromo José Carlos Pace

PICTURE: ZAK MAUGER. ILLUSTRATION: ALAN ELDREDGE



RACE DATA

Venue Autódromo

José Carlos Pace

First GP 1973**Laps** 71**Circuit length** 2.677 miles**Race distance** 190.082 miles**Lap record** 1m10.540s

Valtteri Bottas (2018)

F1 races held 38**Winners from pole** 16**Pirelli compounds** TBA

CAR PERFORMANCE

Downforce level Medium**Cooling requirement** Medium**Full throttle** 60%**Top speed** 202mph**Average speed** 131mph

TIMETABLE (UK TIME)

Friday 11 November**Practice 1** 15:30-16:30**Qualifying** 19:00-20:00**Saturday** 12 November**Practice 2** 15:30-16:30**Sprint Race** 19:30-20:30**Sunday** 13 November**Race** 18:00**Live coverage** Sky Sports F1**Highlights** Channel 4

THE MAIN EVENT

Known under the more prosaic title of Interlagos (literally 'between lakes') until 1985, this track was over 30 years old before it hosted its first world championship grand prix. The site is in a natural bowl so its architects took inspiration from a number of sources including the Indianapolis oval and Roosevelt Raceway in Long Island, a sinuous track which packed a great many corners onto a limited piece of real estate. In its original form Interlagos was nearly 8km long, entering a long, banked curve at what is now Turn 1 and following the perimeter of the site before turning back on itself.

In fact, for over a third of the circuit (between the Senna 'S' and Ferradura) cars travel in the opposite direction to the original layout, a unique state of affairs in Formula 1.

2021 RACE RECAP

The world championship battle exploded back into life with a thrilling and often rancorous weekend in which Lewis Hamilton was controversially sent to the back of the grid for Saturday's sprint race. He charged through to fifth but then had a five-place grid penalty for fitting a new internal combustion engine, a team tactic to get another one into the pool for the championship run-in.

Max Verstappen started from second on the grid but quickly snatched the lead from Valtteri Bottas. Further controversy ensued when Max appeared to push Lewis wide deliberately at Turn 4 when Hamilton challenged him for the lead on lap 48. Lewis later made the move stick and won by 10.4s.

KEY CORNER: TURN 12 The much-mispronounced Junção is a slow-ish corner which will be tricky in the new generation of cars. A decent exit from here is a must because it leads on to the main straight and subsequently Turn 1, the track's premier overtaking spot.



THE PAST FIVE WINNERS HERE



2021

Lewis
Hamilton
Mercedes

2019

Max
Verstappen
Red Bull

2018

Lewis
Hamilton
Mercedes

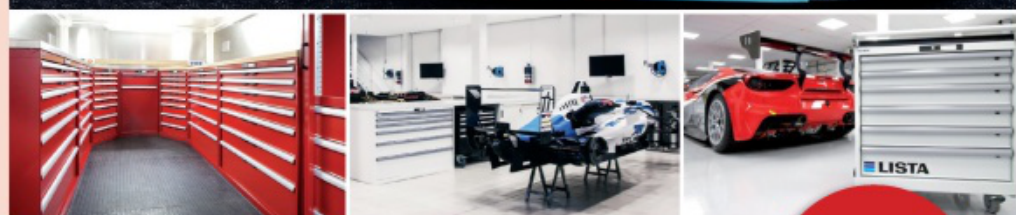
2017

Sebastian
Vettel
Ferrari

2016

Lewis
Hamilton
Mercedes

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British menswear specialist Hackett has unveiled its Autumn-Winter 2022 collection in collaboration with 2009 F1 world champion Jenson Button. The ad campaign, shot by renowned fashion photographer Charlie Gray, features Jenson wearing items from the new range while enjoying a variety of autumnal scenes in the country,

while “the collection also harkens back to its London roots in its colour palette and sartorial expertise”.

Eagle-eyed fashionistas will also note this is the launching pad for a new Hackett brand identity, featuring a new sans serif typeface as well as a simplified version of the famous bowler-hat-and-umbrella logo.



RAOUL ‘SONNY’ BALCAEN

Authors Raoul Balcaen, Pete Lyons, Jill Amadio

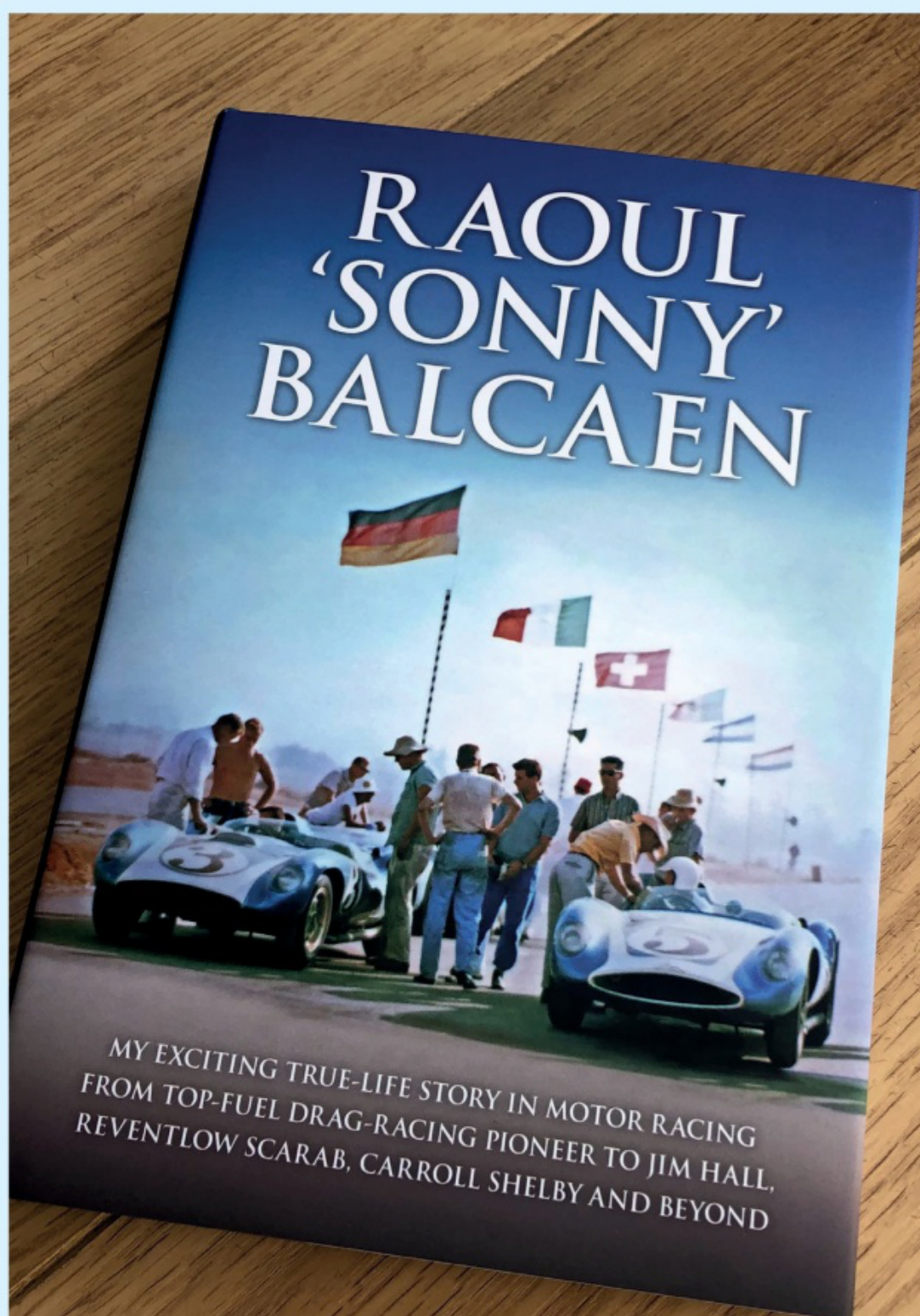
Price £30

evropublishing.com

Perhaps better known for his antics in drag racing – he’s credited with developing the first full-bodied magnesium-skin dragster and built his first top-fuel racer at the age of 17 – Raoul Balcaen is one of 20th century US racing’s great characters. Besides working with the likes of Carroll Shelby and Jim Hall in sportscars, Balcaen was also involved in the Scarab project,

Woolworth heir Lance Reventlow’s ambitious but ultimately doomed attempt to take on the continental greats in sportscars and Formula 1.

Though it only diverts briefly into the world of F1 it’s an entertaining and characterful read which brings to life the Southern California motor racing scene as it exploded into life during the middle part of the last century.





RAYMOND WEIL LIMITED EDITION FREELANCER BRONZE 7780

Price £2995-3495
raymond-weil.co.uk

Raymond Weil's latest limited-edition timepiece is based on a custom motorcycle commissioned by the company from Meister Engineering, and featuring the brand's logo emblazoned on the fuel tank in rose gold foil. The watch face has a symmetrical bi-compax layout within a 43.5mm bronze case whose colour and texture was inspired by the motorbike's design treatment.

A tachymeter scale on the satin-

finished ceramic bezel insert enables the wearer to calculate the speed of a vehicle over a known distance, while a 'pulsometer scale' on the bronze-toned flange enables them to calculate an individual's heart rate. The Freelancer Bronze 7780 is available in two variants limited to 300 pieces, one with orange accents and the other with blue accents. Both feature a brown calf-leather strap with contrasting stitching.



INSIDE F1

Author Lee McKenzie

Price £20

blackandwhitepublishing.com

Broadcaster and journalist

Lee McKenzie should require no introduction to *GP Racing* readers, having worked as pitlane reporter and anchor for both the BBC and Channel 4 (her work to fill airtime on the Saturday of the 2010 Japanese GP, when rain meant no action on track, was nothing less than heroic). *Inside F1* tells the stories of seven F1 stars – Lewis Hamilton, Max

Verstappen, Michael Schumacher, Sebastian Vettel, Fernando Alonso, Jenson Button and Felipe Massa – through Lee's own experience of interviewing and travelling with them during their careers.

It's a very different perspective on the careers of drivers who have defined F1 for more than two decades. Lee herself reads the audiobook version.





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THE FINAL LAP

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SQUEEZE AND THEN SQUEEZE SOME MORE...

The 'L' and 'M' in Liberty Media certainly don't covertly stand for 'Less is More'. There's much to be said for the growth of Formula 1 since its American takeover in 2017. Audiences have boomed, revenues rocketed, and investors and commercial partners enticed. But there's surely a risk that the championship one day, perhaps sooner than later, becomes a victim of its own success.

For this, see the record-breaking provisional calendar for the 2023 Formula 1 season with 24 rounds and, thanks to six sprint contests, 30 races. Now, there's nothing new in highlighting the shortcomings of a new schedule or its constituent events. However, this time around there are more reasons to do so than ever before.

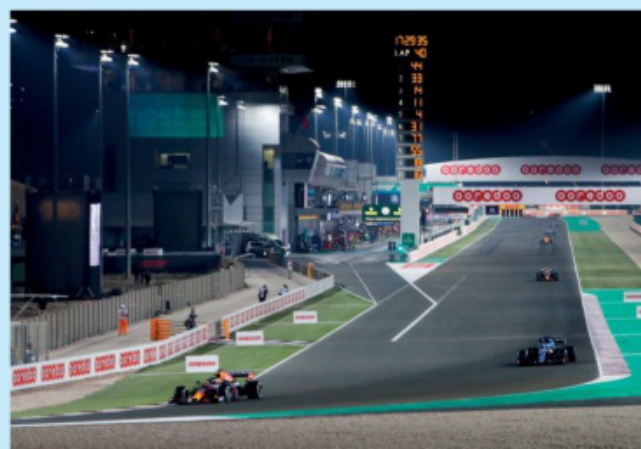
Firstly, the monetary motivation that enables Saudi Arabia to bank its place even after the missile strike and oh-so-close driver boycott back

in March, plus the featureless Losail circuit in Qatar reprising its joyless role. Even though China will likely be kyboshed by COVID, and Spa and Monaco return with new contracts, the choice of some venues leaves much to be desired.

Then there's two triple-headers, which will test the endurance of teams and crew to breaking point (and the patience of their nearest and dearest at home). Also, don't forget the second Miami Grand



Qatar returns to the calendar at the dull Losail circuit (below) and Miami (above) is sandwiched between Azerbaijan and Imola...



Prix serving as an incongruous filling in an Azerbaijan-Imola sandwich before Canada splits Spain and Austria. Those travel quandaries are similar to the ones present in 2022. Now, though, F1 is supposedly championing sustainability, and this new running order was meant to ease both the logistical headaches and F1's carbon footprint. It hasn't done that.

But what about those tuning in at home? Has the calendar swelled to such proportions that viewer fatigue and disengagement could set in? In the first instance, all looks good. F1 is often compared to the Premier League. If you're willing to forego tuning in for practice and qualifying, 24 lots of two hours on a Sunday (sprints not included) is less of a time commitment than watching the football team you support play 38 games, excluding cup competitions.

However, if F1 continues to operate a 'more is more' approach, it seems inevitable a limit will be found – a point which will only

become obvious once exceeded. There can be too much of a good thing. Especially since, historically, the 2021-spec final-race title decider is more an exception than the rule, particularly as a period of Red Bull and Max Verstappen dominance looms during this second ground-effect era. You can't bank on every campaign going down to the wire to keep viewers engrossed until the final chequered flag of the season.

It's hard to imagine series CEO Stefano Domenicali has ever heard of axed primetime cop drama *The Bill*, let alone was a regular watcher in the late 1980s and early 90s. But just maybe there is a lesson to be learned from when the ITV network tried to exploit the show's popularity by going from two episodes a week to three, only for audience growth to tail off, forcing a series of increasingly desperate format changes before it was finally dropped (well, that's what my older colleagues tell me).

Format changes? More episodes? Liberty Media is already applying this methodology to F1 with the expanded calendar and the introduction of sprint races. But audience growth cannot be infinite. There will come a time when it reaches a peak and begins to flatten or even decline. We can only hope that when that point comes, Liberty isn't tempted to resort to even more desperate measures to spice up the show...

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